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| **ACA-111\_1997SU** | **College Student Success** | **ACA-111** |

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| CIS Course ID | S13509 |
| Effective Term | Summer 1997 |
| End Term |  |

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| Class | 1 | Lab | 0 | Clinical | 0 | Work | 0 | Credit | 1 |

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| This course introduces the college's physical, academic, and social environment and promotes the personal development essential for success. Topics include campus facilities and resources; policies, procedures, and programs; study skills; and life management issues such as health, self-esteem, motivation, goal-setting, diversity, and communication. Upon completion, students should be able to function effectively within the college environment to meet their educational objectives. |

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| State Prerequisites | None |

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| State Corequisites | None |

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| **ACA-122\_2014SU** | **College Transfer Success** | **ACA-122** |

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| CIS Course ID | S24018 |
| Effective Term | Summer 2014 |
| End Term |  |

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| Class | 0 | Lab | 2 | Clinical | 0 | Work | 0 | Credit | 1 |

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| This course provides information and strategies necessary to develop clear academic and professional goals beyond the community college experience. Topics include the CAA, college policies and culture, career exploration, gathering information on senior institutions, strategic planning, critical thinking, and communications skills for a successful academic transition. Upon completion, students should be able to develop an academic plan to transition successfully to senior institutions. |

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| Competencies |
| 1. Develop a strategic plan for completing community college academic goals, including certificates, diplomas, and/or associate degrees. 2. Develop a strategic plan for transferring to a university and preparing for a new career. 3. Identify the rights and responsibilities of transfer students under the Comprehensive Articulation Agreement (CAA), including Universal General Education Transfer Component (UGETC) designated courses, the Transfer Assured Admissions Policy (TAAP), the CAA appeals process, and university tuition surcharge. 4. Evaluate learning strategies, including note-taking, test-taking, information processing, time management, and memorization techniques, and identify strategies for improvement. 5. Identify essential college resources, including financial aid, advising, registration, tutoring, library services, computer labs, and counseling services and recognize the importance of these resources on student success. 6. Identify essential college policies and procedures, including academic integrity such as avoiding plagiarism; calculating a GPA, and maintaining satisfactory academic progress for financial aid eligibility and/or good academic standing. |

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| State Prerequisites | None |

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| State Corequisites | None |

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| **AHR-110\_2013FA** | **Intro to Refrigeration** | **AHR-110** |

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| CIS Course ID | S23419 |
| Effective Term | Fall 2013 |
| End Term |  |

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| Class | 2 | Lab | 6 | Clinical | 0 | Work | 0 | Credit | 5 |

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| This course introduces the basic refrigeration process used in mechanical refrigeration and air conditioning systems. Topics include terminology, safety, and identification and function of components; refrigeration cycle; and tools and instrumentation used in mechanical refrigeration systems. Upon completion, students should be able to identify refrigeration systems and components, explain the refrigeration process, and use the tools and instrumentation of the trade. |

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| Competencies |
| Student Learning Outcomes 1. Demonstrate safe practices and procedures with tools, materials, and industry accepted test equipment covered in the course. 2. Identify and explain the theory, operating principle, and components of the refrigeration cycle. 3. Identify tools, materials, and equipment used in the refrigeration industry. 4. Evacuate, charge, recover, and safely operate a basic refrigeration /cooling system in accordance with EPA regulations. 5. Demonstrate refrigeration piping and soldering techniques. |

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| State Prerequisites | None |

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| State Corequisites | None |

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| **AHR-111\_2013FA** | **HVACR Electricity** | **AHR-111** |

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| CIS Course ID | S23420 |
| Effective Term | Fall 2013 |
| End Term |  |

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| Class | 2 | Lab | 2 | Clinical | 0 | Work | 0 | Credit | 3 |

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| This course introduces electricity as it applies to HVACR equipment. Emphasis is placed on power sources, interaction of electrical components, wiring of simple circuits, and the use of electrical test equipment. Upon completion, students should be able to demonstrate good wiring practices and the ability to read simple wiring diagrams. |

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| Competencies |
| Student Learning Outcomes 1. Demonstrate safe practices and procedures with tools, materials, and industry accepted test equipment covered in the course. 2. Be able to use electrical test instruments. 3. Demonstrate knowledge of electricity as applied to heating, ventilation, air conditioning and refrigeration machines. 4. Identify the various electrical components used in HVAC equipment and explain their operation. 5. Use Ohm's Law to calculate the current, voltage, and resistance in a circuit. 6. Draw and interpret wiring schematics for installation and troubleshooting. 7. Follow systematic troubleshooting procedure to diagnose electrical problems and control circuit problems. |

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| State Prerequisites | None |

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| State Corequisites | None |

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| **AHR-112\_2013FA** | **Heating Technology** | **AHR-112** |

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| CIS Course ID | S23421 |
| Effective Term | Fall 2013 |
| End Term |  |

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| Class | 2 | Lab | 4 | Clinical | 0 | Work | 0 | Credit | 4 |

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| This course covers the fundamentals of heating including oil, gas, and electric heating systems. Topics include safety, tools and instrumentation, system operating characteristics, installation techniques, efficiency testing, electrical power, and control systems. Upon completion, students should be able to explain the basic oil, gas, and electrical heating systems and describe the major components of a heating system. |

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| Competencies |
| Student Learning Outcomes 1. Demonstrate safe practices and procedures with tools, materials, and industry accepted test equipment covered in the course. 2. Use industry terminology to describe principles for oil, gas, and electric warm air heating systems. 3. Identify the major components of oil, gas, and electric heating systems. 4. Install and start-up warm air heating systems. 5. Identify various types of energy sources used in heating and describe the individual characteristics of each. 6. Describe service procedures for heating systems. 7. Use tools and instruments necessary to troubleshoot and test system efficiency. |

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| State Prerequisites | None |

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| State Corequisites | None |

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| **AHR-113\_1997SU** | **Comfort Cooling** | **AHR-113** |

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| CIS Course ID | S14131 |
| Effective Term | Summer 1997 |
| End Term | Summer 2014 |

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| Class | 2 | Lab | 4 | Clinical | 0 | Work | 0 | Credit | 4 |

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| This course covers the installation procedures, system operations, and maintenance of residential and light commercial comfort cooling systems. Topics include terminology, component operation, and testing and repair of equipment used to control and produce assured comfort levels. Upon completion, students should be able to use psychrometrics, manufacturer specifications, and test instruments to determine proper system operation. |

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| State Prerequisites | None |

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| State Corequisites | None |

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| **AHR-114\_2013FA** | **Heat Pump Technology** | **AHR-114** |

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| CIS Course ID | S23423 |
| Effective Term | Fall 2013 |
| End Term |  |

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| Class | 2 | Lab | 4 | Clinical | 0 | Work | 0 | Credit | 4 |

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| This course covers the principles of air source and water source heat pumps. Emphasis is placed on safety, modes of operation, defrost systems, refrigerant charging, and system performance. Upon completion, students should be able to understand and analyze system performance and perform routine service procedures. |

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| Competencies |
| Student Learning Outcomes 1. Demonstrate safe practices and procedures with tools, materials, and industry accepted test equipment covered in the course. 2. Diagram refrigerant flow through a heat pump in both the heating and cooling mode identifying refrigerant conditions and pressures. 3. Explain the defrost cycle for air-to-air heat pumps. 4. Identify and troubleshoot electrical control system components for heat pumps. 5. Identify and troubleshoot refrigeration system components for heat pumps. 6. Identify and describe the different types of heat pumps in relation to their source of heat. |

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| State Prerequisites | Take One: AHR-110 or AHR-113 |

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| State Corequisites | None |

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| **AHR-115\_1997SU** | **Refrigeration Systems** | **AHR-115** |

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| CIS Course ID | S14137 |
| Effective Term | Summer 1997 |
| End Term |  |

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| Class | 1 | Lab | 3 | Clinical | 0 | Work | 0 | Credit | 2 |

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| This course introduces refrigeration systems and applications. Topics include defrost methods, safety and operational control, refrigerant piping, refrigerant recovery and charging, and leak testing. Upon completion, students should be able to assist in installing and testing refrigeration systems and perform simple repairs. |

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| State Prerequisites | Take AHR-110 |

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| State Corequisites | None |

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| **AHR-120\_1997SU** | **HVACR Maintenance** | **AHR-120** |

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| CIS Course ID | S13153 |
| Effective Term | Summer 1997 |
| End Term |  |

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| Class | 1 | Lab | 3 | Clinical | 0 | Work | 0 | Credit | 2 |

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| This course introduces the basic principles of industrial air conditioning and heating systems. Emphasis is placed on preventive maintenance procedures for heating and cooling equipment and related components. Upon completion, students should be able to perform routine preventive maintenance tasks, maintain records, and assist in routine equipment repairs. |

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| State Prerequisites | None |

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| State Corequisites | None |

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| **AHR-130\_2013FA** | **HVAC Controls** | **AHR-130** |

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| CIS Course ID | S23273 |
| Effective Term | Fall 2013 |
| End Term |  |

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| Class | 2 | Lab | 2 | Clinical | 0 | Work | 0 | Credit | 3 |

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| This course covers the types of controls found in residential and commercial comfort systems. Topics include electrical and electronic controls, control schematics and diagrams, test instruments, and analysis and troubleshooting of electrical systems. Upon completion, students should be able to diagnose and repair common residential and commercial comfort system controls. |

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| State Prerequisites | Take One: AHR-111, ELC-111, or ELC-112 |

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| State Corequisites | None |

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| **AHR-151\_1997SU** | **HVAC Duct Systems I** | **AHR-151** |

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| CIS Course ID | S14323 |
| Effective Term | Summer 1997 |
| End Term |  |

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| Class | 1 | Lab | 3 | Clinical | 0 | Work | 0 | Credit | 2 |

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| This course introduces the techniques used to lay out and fabricate duct work commonly found in HVAC systems. Emphasis is placed on the skills required to fabricate duct work. Upon completion, students should be able to lay out and fabricate simple duct work. |

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| State Prerequisites | None |

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| State Corequisites | None |

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| **AHR-160\_1997SU** | **Refrigerant Certification** | **AHR-160** |

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| CIS Course ID | S12778 |
| Effective Term | Summer 1997 |
| End Term |  |

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| Class | 1 | Lab | 0 | Clinical | 0 | Work | 0 | Credit | 1 |

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| This course covers the requirements for the EPA certification examinations. Topics include small appliances, high pressure systems, and low pressure systems. Upon completion, students should be able to demonstrate knowledge of refrigerants and be prepared for the EPA certification examinations. |

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| State Prerequisites | None |

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| State Corequisites | None |

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| **AHR-170\_2008SU** | **Heating Lab** | **AHR-170** |

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| CIS Course ID | S22130 |
| Effective Term | Summer 2008 |
| End Term |  |

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| Class | 0 | Lab | 3 | Clinical | 0 | Work | 0 | Credit | 1 |

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| This course provides a laboratory experience in heating technology. Emphasis is placed on providing practical experience in the fundamentals of heating. Upon completion, students should be able to demonstrate an understanding of electric, oil, and gas fueled heating systems. |

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| State Prerequisites | None |

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| State Corequisites | Take AHR-112 |

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| **AHR-171\_2008SU** | **Comfort Cooling Lab** | **AHR-171** |

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| CIS Course ID | S22131 |
| Effective Term | Summer 2008 |
| End Term |  |

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| Class | 0 | Lab | 3 | Clinical | 0 | Work | 0 | Credit | 1 |

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| This course provides a laboratory experience in comfort cooling. Emphasis is placed on providing practical experience in installation, operations, and maintenance of residential and light commercial comfort cooling systems. Upon completion, students should be able to demonstrate an understanding of comfort cooling systems. |

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| State Prerequisites | None |

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| State Corequisites | Take AHR-113 |

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| **AHR-180\_1997SU** | **HVACR Customer Relations** | **AHR-180** |

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| CIS Course ID | S12067 |
| Effective Term | Summer 1997 |
| End Term |  |

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| Class | 1 | Lab | 0 | Clinical | 0 | Work | 0 | Credit | 1 |

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| This course introduces common business and customer relation practices that may be encountered in HVACR. Topics include business practices, appearance of self and vehicle, ways of handling customer complaints, invoices, telephone communications, and warranties. Upon completion, students should be able to present themselves to customers in a professional manner, understand how the business operates, complete invoices, and handle complaints. |

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| State Prerequisites | None |

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| State Corequisites | None |

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| **AHR-211\_2013FA** | **Residential System Design** | **AHR-211** |

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| CIS Course ID | S23445 |
| Effective Term | Fall 2013 |
| End Term |  |

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| Class | 2 | Lab | 2 | Clinical | 0 | Work | 0 | Credit | 3 |

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| This course introduces the principles and concepts of conventional residential heating and cooling system design. Topics include heating and cooling load estimating, basic psychrometrics, equipment selection, duct system selection, and system design. Upon completion, students should be able to design a basic residential heating and cooling system. |

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| Competencies |
| Student Learning Outcomes 1. Design and draw a duct system in accordance with the ACCA Manual D. 2. Apply appropriate HVACR codes to the design of residential HVACR systems. 3. Calculate heating and cooling loads for residential structures in accordance with ACCA Manual J. |

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| State Prerequisites | None |

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| State Corequisites | None |

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| **AHR-212\_2013FA** | **Advanced Comfort Systems** | **AHR-212** |

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| CIS Course ID | S23446 |
| Effective Term | Fall 2013 |
| End Term |  |

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| Class | 2 | Lab | 6 | Clinical | 0 | Work | 0 | Credit | 4 |

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| This course covers water-cooled comfort systems, water-source/geothermal heat pumps, and high efficiency heat pump systems including variable speed drives and controls. Emphasis is placed on the application, installation, and servicing of water-source systems and the mechanical and electronic control components of advanced comfort systems. Upon completion, students should be able to test, analyze, and troubleshoot water-cooled comfort systems, water-source/geothermal heat pumps, and high efficiency heat pumps. |

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| Competencies |
| Student Learning Outcomes 1. Demonstrate safe practices and procedures with tools, materials, and industry accepted test equipment covered in the course. 2. Identify components of water-cooled comfort systems, water-source/geothermal heat pumps, and high efficiency heat pumps. 3. Compare and contrast standard and high efficiency heat pumps. 4. Design and size earth coupled piping loops for geothermal heat pump systems. 5. Describe geothermal heat pump operation. 6. Test duct systems for proper airflow and make adjustments. |

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| State Prerequisites | Take AHR-114 |

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| State Corequisites | None |

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| **AHR-213\_2013FA** | **HVACR Building Code** | **AHR-213** |

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| CIS Course ID | S23447 |
| Effective Term | Fall 2013 |
| End Term |  |

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| Class | 1 | Lab | 2 | Clinical | 0 | Work | 0 | Credit | 2 |

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| This course covers the North Carolina codes that are applicable to the design and installation of HVACR systems. Topics include current North Carolina codes as applied to HVACR design, service, and installation. Upon completion, students should be able to demonstrate the correct usage of North Carolina codes that apply to specific areas of the HVACR trade. |

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| Competencies |
| Student Learning Outcomes 1. Apply the mechanical, gas, and energy code of North Carolina for designing, installing, maintaining and servicing HVACR systems. 2. Define terms and abbreviations using codes applicable to the HVACR trade. 3. Analyze information to conform to North Carolina mechanical, gas, and energy code. 4. Describe sources of authority and methods of enforcement. |

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| State Prerequisites | None |

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| State Corequisites | None |

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| **BPR-130\_2013FA** | **Print Reading-Construction** | **BPR-130** |

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| CIS Course ID | S23275 |
| Effective Term | Fall 2013 |
| End Term |  |

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| Class | 3 | Lab | 0 | Clinical | 0 | Work | 0 | Credit | 3 |

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| This course covers the interpretation of prints and specifications that are associated with design and construction projects. Topics include interpretation of documents for foundations, floor plans, elevations, and related topics. Upon completion, students should be able to read and interpret construction prints and documents. |

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| Competencies |
| Student Learning Outcomes 1.Identify the different symbols and line types in a set of working drawings. 2.Correctly measure lines to a specific scale using an architectural or engineering scale. 3.Demonstrate proficiency in interpreting construction prints in the form of floor plans, elevations, details, schedules, and specifications. 4.Convert fractional dimensions to decimal dimensions and decimal dimensions to fractional dimensions. 5.Describe and explain the difference between working drawings and construction drawings. |

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| State Prerequisites | None |

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| State Corequisites | None |

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| **CIS-110\_2006SP** | **Introduction to Computers** | **CIS-110** |

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| CIS Course ID | S21058 |
| Effective Term | Spring 2006 |
| End Term |  |

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| Class | 2 | Lab | 2 | Clinical | 0 | Work | 0 | Credit | 3 |

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| This course introduces computer concepts, including fundamental functions and operations of the computer. Topics include identification of hardware components, basic computer operations, security issues, and use of software applications. Upon completion, students should be able to demonstrate an understanding of the role and function of computers and use the computer to solve problems. |

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| Competencies |
| 1. Identify the basic elements required in a computer system. 2. Produce electronic documents using various software applications. 3. Illustrate the role of the computer for personal and professional uses. |

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| State Prerequisites | None |

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| State Corequisites | None |

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| **COM-231\_1997SU** | **Public Speaking** | **COM-231** |

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| CIS Course ID | S12601 |
| Effective Term | Summer 1997 |
| End Term |  |

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| Class | 3 | Lab | 0 | Clinical | 0 | Work | 0 | Credit | 3 |

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| This course provides instruction and experience in preparation and delivery of speeches within a public setting and group discussion. Emphasis is placed on research, preparation, delivery, and evaluation of informative, persuasive, and special occasion public speaking. Upon completion, students should be able to prepare and deliver well-organized speeches and participate in group discussion with appropriate audiovisual support. |

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| State Prerequisites | None |

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| State Corequisites | None |

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| ELC-111\_1997SU | Intro to Electricity | ELC-111 |

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| CIS Course ID | S11841 |
| Effective Term | Summer 1997 |
| End Term |  |

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| Class | 2 | Lab | 2 | Clinical | 0 | Work | 0 | Credit | 3 |

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| This course introduces the fundamental concepts of electricity and test equipment to non-electrical/electronics majors. Topics include basic DC and AC principles (voltage, resistance, current, impedance); components (resistors, inductors, and capacitors); power; and operation of test equipment. Upon completion, students should be able to construct and analyze simple DC and AC circuits using electrical test equipment. |

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| State Prerequisites | None |

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| State Corequisites | None |

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| ENG-111\_2020FA | Writing and Inquiry | ENG-111 |

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| CIS Course ID | S25433 |
| Effective Term | Fall 2020 |
| End Term |  |

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| Class | 3 | Lab | 0 | Clinical | 0 | Work | 0 | Credit | 3 |

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| This course is designed to develop the ability to produce clear writing in a variety of genres and formats using a recursive process. Emphasis includes inquiry, analysis, effective use of rhetorical strategies, thesis development, audience awareness, and revision. Upon completion, students should be able to produce unified, coherent, well-developed essays using standard written English. |

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| Competencies |
| Student Learning Outcomes 1. Demonstrate writing as a recursive process. 2. Demonstrate writing and inquiry in context using different rhetorical strategies to reflect, analyze, explain, and persuade in a variety of genres and formats. 3. Students will reflect upon and explain their writing strategies.  4. Demonstrate the critical use and examination of printed, digital, and visual materials. 5. Locate, evaluate, and incorporate relevant sources with proper documentation. 6. Compose texts incorporating rhetorically effective and conventional use of language. 7. Collaborate actively in a writing community. |

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| State Prerequisites | Take One Set: Set 1: DRE-097 Set 2: ENG-002 Set 3: BSP-4002 |

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| State Corequisites | Take ENG-011 |

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| **ISC-112\_2013FA** | **Industrial Safety** | **ISC-112** |

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| CIS Course ID | S23527 |
| Effective Term | Fall 2013 |
| End Term |  |

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| Class | 2 | Lab | 0 | Clinical | 0 | Work | 0 | Credit | 2 |

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| This course introduces the principles of industrial safety. Emphasis is placed on industrial safety and OSHA regulations. Upon completion, students should be able to demonstrate knowledge of a safe working environment and OSHA compliance. |

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| Competencies |
| Student Learning Outcomes 1. Describe and identify safety practices required to perform various job-related activities. 2. Describe the application of OSHA procedures and requirements for compliance. |

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| State Prerequisites | None |

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| State Corequisites | None |

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| **ISC-115\_1997SU** | **Construction Safety** | **ISC-115** |

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| CIS Course ID | S12852 |
| Effective Term | Summer 1997 |
| End Term |  |

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| Class | 2 | Lab | 0 | Clinical | 0 | Work | 0 | Credit | 2 |

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| This course introduces the basic concepts of construction site safety. Topics include ladders, lifting, lock-out/tag-out, personal protective devices, scaffolds, and above/below ground work based on OSHA regulations. Upon completion, students should be able to demonstrate knowledge of applicable safety regulations and safely participate in construction projects. |

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| State Prerequisites | None |

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| State Corequisites | None |

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| **MAT-110\_2020FA** | **Math Measurement & Literacy** | **MAT-110** |

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| CIS Course ID | S25428 |
| Effective Term | Fall 2020 |
| End Term |  |

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| Class | 2 | Lab | 2 | Clinical | 0 | Work | 0 | Credit | 3 |

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| This course provides an activity-based approach that develops measurement skills and mathematical literacy using technology to solve problems for non-math intensive programs. Topics include unit conversions and estimation within a variety of measurement systems; ratio and proportion; basic geometric concepts; financial literacy; and statistics including measures of central tendency, dispersion, and charting of data. Upon completion, students should be able to demonstrate the use of mathematics and technology to solve practical problems, and to analyze and communicate results. |

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| Competencies |
| ·Student Learning Outcomes 1. Demonstrate estimation skills and justify results. 2. Use dimensional analysis to convert units of measurement. 3. Employ fractions, percentages and proportions to solve contextual problems. 4. Compute geometric measurements of perimeter, area, volume and angles.  5. Use technology to analyze and interpret elements of personal finance. 6. Compare and contrast measures of center and measures of dispersion. 7. Interpret tables, charts, and graphs and communicate results. |

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| State Prerequisites | Take One Set: Set 1: DMA-010, DMA-020, and DMA-030 Set 2: DMA-025 Set 3: MAT-003 Set 4: BSP-4003 |

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| State Corequisites | Take MAT-010 |

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| **PHY-110\_1997SU** | **Conceptual Physics** | **PHY-110** |

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| CIS Course ID | S12004 |
| Effective Term | Summer 1997 |
| End Term |  |

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| Class | 3 | Lab | 0 | Clinical | 0 | Work | 0 | Credit | 3 |

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| This course provides a conceptually-based exposure to the fundamental principles and processes of the physical world. Topics include basic concepts of motion, forces, energy, heat, electricity, magnetism, and the structure of matter and the universe. Upon completion, students should be able to describe examples and applications of the principles studied. |

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| State Prerequisites | None |

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| State Corequisites | None |

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| PSY-150\_1997SU | General Psychology | PSY-150 |

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| CIS Course ID | S10777 |
| Effective Term | Summer 1997 |
| End Term |  |

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| Class | 3 | Lab | 0 | Clinical | 0 | Work | 0 | Credit | 3 |

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| This course provides an overview of the scientific study of human behavior. Topics include history, methodology, biopsychology, sensation, perception, learning, motivation, cognition, abnormal behavior, personality theory, social psychology, and other relevant topics. Upon completion, students should be able to demonstrate a basic knowledge of the science of psychology. |

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| State Prerequisites | None |

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| State Corequisites | None |

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| SOC-210\_1997SU | Introduction to Sociology | SOC-210 |

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| CIS Course ID | S11919 |
| Effective Term | Summer 1997 |
| End Term |  |

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| Class | 3 | Lab | 0 | Clinical | 0 | Work | 0 | Credit | 3 |

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| This course introduces the scientific study of human society, culture, and social interactions. Topics include socialization, research methods, diversity and inequality, cooperation and conflict, social change, social institutions, and organizations. Upon completion, students should be able to demonstrate knowledge of sociological concepts as they apply to the interplay among individuals, groups, and societies. |

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| State Prerequisites | None |

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| State Corequisites | None |

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| **WBL-111\_2014FA** | **Work-Based Learning I** | **WBL-111** |

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| CIS Course ID | S23794 |
| Effective Term | Fall 2014 |
| End Term |  |

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| Class | 0 | Lab | 0 | Clinical | 0 | Work | 10 | Credit | 1 |

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| This course provides a work-based learning experience with a college-approved employer in an area related to the student's program of study. Emphasis is placed on integrating classroom learning with related work experience. Upon completion, students should be able to evaluate career selection, demonstrate employability skills, and satisfactorily perform work-related competencies. |

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| State Prerequisites | None |

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| State Corequisites | None |

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| **WLD-113\_2009SU** | **Soldering and Brazing** | **WLD-113** |

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| CIS Course ID | S22464 |
| Effective Term | Summer 2009 |
| End Term |  |

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| Class | 1 | Lab | 2 | Clinical | 0 | Work | 0 | Credit | 2 |

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| This course covers procedures for cutting, soldering and brazing of pipe and tubing. Topics include safety, proper equipment setup, and operation of soldering and brazing equipment. Upon completion, students should be able to solder and braze pipe, tubing, and fittings in various positions. |

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| State Prerequisites | None |

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| State Corequisites | None |