

**Competencies for the
Automated Systems Concentration
&
IT courses that satisfy the Competencies**

<i>Mathematics, Science and Statistics</i>	<i>IT Courses</i>
Graduates are able to apply mathematical and scientific principles to manufacturing situations.	111, 112, 215, 233, 236, 242, 264, 322, 331, 351, 405, 406, 442, 444
Graduates are able to use appropriate statistical procedures for specific manufacturing applications	111, 112, 322, 406, 407, 442, 444
<i>Materials</i>	
Graduates know material properties/characteristics, and appropriate uses in manufacturing.	111, 215, 242, 256, 264, 322, 351, 442, 444
Graduates know how to change a material's properties by application of heat and other treatments.	242, 256, 322, 351, 442
<i>Product Design</i>	
Graduates know standards and are able to read and interpret prints and symbols.	111, 112, 215, 233, 236, 242, 256, 264, 322, 331, 351, 405, 406, 442, 444
Graduates are able to utilize a CAD system to produce engineering drawings and sketch product specifications.	111, 112, 215, 406, 442
<i>Manufacturing Processes</i>	
Graduates know the application and requirements for manufacturing processes, tools and machines.	215, 242, 256, 264, 351, 406, 407, 442, 444
Graduates are able to plan, route and monitor production schedules.	351, 406, 407, 442, 444
Graduates know manufacturing systems and their applications.	242, 322, 351, 405, 406, 442, 444
Graduates know, use and promote safe work procedures.	233, 236, 242, 256, 264, 331, 351, 405, 406, 407, 444
Graduates are able to use inspection, metrology and measurement procedures effectively in manufacturing applications.	111, 242, 256, 264, 351, 405, 406, 442, 444

Graduates are knowledgeable of material handling and automated identification applications.	242, 322, 351, 406, 442, 444
<i>Computer Applications and Automation</i>	<i>IT Courses</i>
Graduates are able to use the computer proficiently in manufacturing applications.	111, 215, 322, 405, 406, 442, 444
Graduates are able to specify robotic and automation systems.	331, 406, 442, 444
Graduates are able to use the computer to program CNC, data collection and robotic applications.	442, 444
Graduates are able to use the computer in production planning, monitoring and controlling.	406, 442, 444
<i>Management and Economics</i>	
Graduates know how to use production planning and control techniques.	406, 444
Graduates know how to use statistical process control techniques.	406, 407, 444
Graduates know how to apply quality systems and quality improvement procedures.	407, 444
Graduates know how to use inventory planning and control techniques.	406, 407, 444
Graduates are able to plan and layout a plant for efficient production.	112, 215, 351, 406, 444
Graduates know and use the principles of cost justification, costs and manufacturing economics.	242, 406, 407, 444
Graduates know and are able to use manufacturing information systems.	406, 442, 444
Graduates are able to function effectively in a team environment.	111, 215, 242, 256, 264, 322, 351, 405, 406, 407, 442, 444

**Competencies for the
Drafting Design Technology Concentration
&
IT and DDT courses that satisfy the Competencies**

<i>Mathematics, Science and Statistics</i>	<i>IT & DDT Courses</i>
Graduates are able to develop geometric constructions required in 2d layout.	IT 111, 112, 215, 216, 311, 405, 406 DDT 113, 211, 212, 215
Graduates are able to use appropriate graphical procedures for determining, slope, grade, pitch, true angles etc.	IT 111, 112, 215, 216, 311, 322, DDT 113, 211, 212, 215
Graduates are able to apply vector analysis in determining magnitudes, velocities etc.	IT 112, 216, 311
Graduates are able to apply mathematical and scientific principles to manufacturing situations.	IT 111, 112, 215, 216, 242, 256, 264, 311, 322, 405, 406 DDT 113, 211, 212, 215
<i>Materials</i>	
Graduates know material properties/characteristics, and appropriate uses in manufacturing.	IT 112, 215, 233, 242, 256, 264, 311, 322, 406 DDT 113, 211, 212, 215
Graduates know how to change a material's properties by application of heat and other treatments.	IT 242, 256, 311, 322, DDT 211, 212
<i>Principles of Orthographic Projection</i>	
Graduates understand the principles of multi-view drawing and sectioning.	IT 111, 112, 215, 216, 242, 311, 406 DDT 113, 211, 212, 215
Graduates can develop primary and successive auxiliaries, and revolutions.	IT 111, 112, 215, 216, 311, 406 DDT 113, 215
Graduates are able to utilize CAD to produce orthographic drawings.	IT 111, 112, 215, 216, 311, 406 DDT 113, 211, 212, 215
<i>Descriptive Geometry</i>	
Graduates are able to develop points in Cartesian space and the true size drawings of lines and planes.	IT 111, 112, 215, 216, 311, 406 DDT 113, 215
Graduates are able to determine true angles between planes, parallelism, and perpendicularity.	IT 112, 215, 216, 311 DDT 113, 211, 212, 215
Graduates are able to develop intersections of planes and solids.	IT 112, 215, 216, 311,
<i>Drawing Annotation</i>	

Graduates are able to accurately apply dimensioning and principles of tolerancing and including size, locational, and geometric.	IT 111, 112, 215, 216, 264, 311, 406 DDT 113, 211, 212, 215
Graduates are able to apply notes, call outs and detailed feature specifications.	IT 111, 112, 215, 311, 406 DDT 113, 211, 212, 215
<i>CAD</i>	
Graduates are proficient in basic computer-aided design and drafting with technical depth in either mechanical, pipe or architectural.	IT 111, 112, 215, 311, 406 DDT 113, 211, 212, 215
Graduates are proficient in 3d modeling and editing.	IT 216, 311 DDT 113, 211, 212, 215
<i>Drafting standards</i>	
Graduates are familiar with ANSI and ISO 9000 standards	IT 111, 112, 215, 311, 406 DDT 113, 211, 212, 215

Graduates are familiar with the application of manuals, handbooks, material and/or equipment specifications,	IT 111, 112, 215 242, 256, 311, 322, 406 DDT 113, 211, 212, 215
<i>Design</i>	
Graduates are familiar with design of machine elements.	IT 215, 216, 311, 406 DDT 212
Graduates are familiar with fasteners, cams and gears.	IT 215, 216, 242, 311, 406 DDT 212
Graduates are familiar with welding drafting.	IT 256, 311 DDT 211
Graduates utilize 3d modeling in machine design and for rapid prototyping.	IT 216, 311, 406 DDT 212
Graduates utilize rapid prototype models for design analysis.	IT 216, 311 DDT 212
<i>Management and Economics</i>	
Graduates know how to use production planning and control techniques.	IT 406
Graduates know how to use inventory planning and control techniques.	IT 406
Graduates are able to plan and layout a plant for efficient production.	IT 311, 406 DDT 113, 211, 212, 215
Graduates are able to function effectively in a team environment.	IT 111, 112, 216, 242, 256, 264, 311, 322, 405, 406 DDT 113, 211, 212, 215

**Competencies for the
Supervision Concentration
&
IT courses that satisfy the Competencies**

<i>Mathematics, Science and Statistics</i>	<i>IT Courses</i>
Graduates are able to apply mathematical and scientific principles to solving planning, scheduling, monitoring and improving production problems	111, 112, 233, 236, 242, 256, 308, 322, 331, 351, 405, 406, 407, 442
Graduates are able to use appropriate statistical procedures for specific manufacturing applications	111, 112, 331, 405, 406, 407, 442
<i>Materials</i>	
Graduates utilize an understanding of material properties/characteristics in planning, scheduling, monitoring and improving production	111, 112, 256, 322, 351, 406, 442
Graduates have the ability to interpret and apply basic concepts of materials science such as strength of materials, structural and mechanical properties	112, 242, 256, 322, 351, 406, 442
Graduates understand and can perform various non-destructive and destructive materials testing procedures	242, 322,
<i>Product Design</i>	
Graduates are familiar with industry standards and are able to read and interpret prints and schematics	111, 112, 233, 236, 242, 256, 264, 322, 331, 351, 405, 406, 442
Graduates can utilize a CAD system to produce engineering drawings and sketches and develop product specifications	111, 112, 331, 406, 442
<i>Manufacturing Processes</i>	
Graduates are knowledgeable about the application of various tools and machines to manufacturing processes	112, 242, 256, 322, 351, 406, 442
Graduates are able to plan, route and monitor production schedules	308, 351, 406, 442
Graduates understand manufacturing systems and their applications.	111, 112, 242, 256, 308, 331, 351, 402, 405, 406, 442

Graduates are knowledgeable about, use and promote safe work procedures.	111, 112, 233, 236, 242, 256, 264, 322, 331, 351, 405, 406, 442
Graduates are able to use inspection, metrology and measurement procedures effectively in manufacturing applications.	111, 242, 256, 351, 405, 442
Graduates are knowledgeable about material handling and automated identification applications.	242, 322, 351, 406, 442
Graduates understand and can apply the principles of lean manufacturing.	308, 405, 406, 407, 442
Graduates can analyze and apply basic electricity and electronic principles within various manufacturing environments and applications, such as industrial robots, controls and other systems.	233, 236, 331, 442
Graduates have the ability to select appropriate manufacturing processes for production.	242, 256, 308, 322, 351, 406, 442
Graduates have the ability to read and interpret manufacturing documentation such as technical drawings and diagrams, production plans, tooling plans, quality plans and safety plans.	111, 112, 233, 236, 242, 256, 264, 308, 331, 351, 406, 442
<i>Computer Applications and Automation</i>	
Graduates are able to use the computer proficiently in manufacturing applications.	111, 112, 233, 236, 331, 405, 406, 442
Graduates are able to specify robotic and automation systems.	331, 442
Graduates are able to use the computer to program CNC, data collection and robotic applications.	442
Graduates are able to use the computer in production planning, monitoring and controlling.	406
Graduates are able to use the computer to perform basic CNC programming and apply robotics in manufacturing applications.	442
<i>Management and Economics</i>	
Graduates are able to use the computer with proficiency in production planning, monitoring and controlling.	406, 442
Graduates know how to use statistical process control techniques.	406, 407

Graduates know how to apply quality systems and quality improvement procedures.	407
Graduates know how to use inventory planning and control techniques.	308, 406, 442
Graduates are able to plan and layout a plant for efficient production.	112, 406
Graduates know and use the principles of cost justification and manufacturing economics.	406, 407, 442
Graduates know and are able to use manufacturing information systems.	308, 406, 442
<i>Interpersonal Skills</i>	
Graduates have effective oral communication skills	111, 112, 236, 242, 256, 264, 308, 322, 351, 402, 405, 406, 407, 442
Graduates have effective written communication skills	111, 112, 233, 242, 256, 264, 308, 322, 331, 351, 402, 405, 406, 407, 442
Graduates have the skills and experience to function effectively in a team environment	111, 112, 242, 256, 264, 322, 331, 351, 402, 405, 406, 407, 442
Graduates have the skills and educational experience to solve technical problems	111, 112, 242, 256, 264, 308, 322, 331, 351, 406, 407, 442
Graduates have the leadership skills and ability to take initiative	111, 112, 242, 256, 351, 402, 406, 407, 442

**CTEC Concentration Competencies
&
CTEC courses that satisfy the Competencies**

<i>Mathematics, Science and Statistics</i>	<i>CTEC Courses</i>
Graduates are able to apply mathematical and scientific principles to construction situations.	111, 121, 171, 201, 202, 203, 271
Graduates are able to use appropriate statistical procedures for specific construction applications.	121, 171, 201, 202, 203, 271
Construction Graphic	
Graduates know how to understand properties/characteristics, and appropriate uses of blueprints.	111, 121, 171, 201, 202, 203, 271
Graduates are able to utilize a CAD system to produce engineering drawings and sketch product specifications.	111, 171, 203, 271
Construction Materials	
Graduates know material properties/characteristics, and appropriate uses in construction.	101, 111, 121, 171, 201, 202, 203, 271
Graduates know how to change a material's properties by application in the construction industry.	121, 171, 201, 202, 203, 271
Survey Principles	
Graduates know the application and requirements for understanding surveying principles use in the construction of a building.	111, 121, 171, 202, 271
Graduates are able to use tools necessary to read and convey information about surveys.	111, 171
Graduates are able to identify, to formulate, and to solve residential and commercial problems related to the survey	111, 171, 271
Computer Applications in Construction	
Graduates are able to use the computer proficiently in the programming of scheduling a project and project estimating.	201, 202, 203, 271

Graduates are able to use the tools necessary to read and convey information about scheduling and estimating.	201, 202, 203, 271
Graduates are able to solve problems and produce a correct solution using software related to scheduling.	201, 202, 203, 271
Graduates are able to use the computer in merge of a scheduling and estimating.	201, 202, 203, 271
<i>Project Management and Supervision</i>	
Graduates know how to use project planning and control techniques.	201, 202, 203, 271
Graduates know how management and supervision are used in the construction of a building.	201, 202, 203, 271
Graduates know to solve problems and produce a correct solution as a project manager or supervisor.	201, 202, 203, 271
Graduates know how to identify, to formulate, and to solve problems related to project management and supervision.	201, 202, 203, 271
<i>Estimating</i>	
Graduates know the components needed to estimate a building	111, 121, 201, 202, 203, 271
Graduates solve problems and produce a correct solution to estimating and bidding.	111, 121, 201, 202, 203, 271
Graduates know how to use the industry tools necessary to read and convey information about estimates.	111, 121, 201, 202, 203, 271