

State-Approved Technical Skill Assessments

5/1/2017

Pathway: Engineering & Technology - Mechanical Design/ Drafting

Cluster: Science, Technology, Engineering, & Mathematics

CLUSTER/ PATHWAY/ PROGRAM	CERTIFICATION / ASSESSMENT TITLE	TYPE	ISSUING ORGANIZATION	WEBSITE Please report broken weblinks	ELIGIBILITY REQUIREMENTS / PREREQUISITES	ADMINISTRA- TION ELIGIBILITY (Written, Oral, Practical, etc.)	PASSING SCORE	COST	COMMENTS
<p>● For use at SECONDARY For use at SECONDARY For use at SECONDARY For use at SECONDARY</p>									
CLUSTER: Introduction to Engineering Technology	Engineering Technology	Academic Assessment	SkillsUSA Work Force Ready System	http://www.workforcereadysystem.org/media/blueprints/EngineeringTechnology_blueprint.pdf	Entry-level assessment that verifies student mastery of the knowledge and skills that provide the foundation for all engineering careers.	Online; Estimated time for assessment: Approximately 1 hour	65%	\$10 per exam if SkillsUSA member; \$20 per exam	50 questions included in exam; estimated
	SkillsUSA Work Force Ready System	SkillsUSA	SITE COORDINATOR	Each institution / consortium should have a coordinator who contacts SkillsUSA to obtain assessment exams, proctoring information, data management needs, and other important functions. Your Proctor name, email address and phone number are required when ordering assessments to be administered to students.	Click below for the SkillsUSA Work Force Ready System Web site and browse the various Assessment Links and other details: http://www.workforcereadysystem.org				

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CLUSTER: Introduction to Engineering Technology	Pre- Engineering/ Engineering Technology	Academic Assessment	NOCTI	http://www.nocti.org/PDFs/JobReady/2475_Pre-Engineering.pdf	Job-ready assessment that verifies student mastery of the knowledge and skills that provide the foundation for pre- engineering.	Online; Estimated time for assessment: Up to 3 hours; in 1, 2, or 3 sessions	Criterion- Referenced Cut Score (50.1%)	\$19 for post- test only; \$31 for pre- test and post- test.	Job-Ready Assessment - 202 item multiple choice exam
Mechanical Design/ Drafting - Introduction to Engineering Design	CAD	Academic Assessment	NOCTI	http://www.nocti.org/PDFs/JobReady/4973_CAD.pdf		Online; Estimated time for assessment: Up to 3 hours; in 1, 2, or 3 sessions	Criterion- Referenced Cut Score (50.1%)	\$19 for post- test only; \$31 for pre- test and post- test.	Job-Ready Assessment - 202 item multiple choice exam
Mechanical Design/ Drafting - Introduction to Engineering Design	Mechanical Drafting & Design	Academic Assessment	NOCTI	http://www.nocti.org/PDFs/JobReady/4038_Mechanical_Drafting.pdf		Online; Estimated time for assessment: Up to 3 hours; in 1, 2, or 3 sessions	Criterion- Referenced Cut Score (50.1%)	\$19 for post- test only; \$31 for pre- test and post- test.	Job-Ready Assessment - 202 item multiple choice exam

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	NOCTI Testing Information for Consortia Leaders and/or High School Testing Coordinators	NOCTI	TESTING AGREEMENT	Each institution/ consortium should have a Testing Coordinator who contacts NOCTI to obtain assessment exams, proctoring information, data management needs, and other important functions. Click here for the NOCTI Testing Agreement form: http://www.nocti.org/forms.cfm					
Mechanical Drafting/ Introduction to Engineering Design	Drafting: Drafting Technician	Academic Assessment	Oklahoma CareerTech	http://www.okcareercenter.org/educators/assessments-and-testing/testing/study-guides/study-guides-ok-works-2015-2016/DraftingSG.pdf	Broad based, entry-level assessment that verifies student mastery of the knowledge and skills that provide the foundation as a drafting technician.	Online; Estimated time for assessment: Approximately 1 hour	70%	\$12 per exam	Approximately 40 multiple-choice questions
Mechanical Drafting/ Introduction to Engineering Design	Drafting: Mechanical Drafter	Academic Assessment	Oklahoma CareerTech	http://www.okcareercenter.org/educators/assessments-and-testing/testing/study-guides/study-guides-ok-works-2015-2016/DraftingSG.pdf	Entry level assessment that verifies student mastery of the knowledge and skills that provide the foundation for mechanical drafting.	Online; Estimated time for assessment: Approximately 1 hour	70%	\$12 per exam	Approximately 40 multiple-choice questions

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	Careertech Testing Information for Consortia Leaders and/or High School Testing Coordinators	Careertech	TESTING AGREEMENT	Each institution/ consortium should have a Testing Coordinator who contacts Careertech to obtain assessment exams, proctoring information, data management needs, and other important functions. Click here for the Careertech Testing Agreement form: http://www.okcareertech.org/about/state-agency/divisions/testing					
Introduction to Engineering Design	Introduction to Engineering Design (IED)	Academic Assessment	Project Lead the Way (PLTW)	http://www.pltw.org	End of Course assessment that verifies student mastery of the knowledge and skills that provide the foundation for engineering design including mechanical engineering.	On Line, 45 minute-timed	Pass/Fail	*No Fee; assessment is part of the annual license.	*There is no fee to PLTW Certified high schools.

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Introduction to Engineering Design/ Principles of Engineering	Principles of Engineering (POE)	Academic Assessment	Project Lead the Way (PLTW)	http://www.pltw.org	End of Course assessment that verifies student mastery of the knowledge and skills that provide the foundation for engineering including mechanical engineering.	On Line, 45 minute-timed	Pass/Fail	*No Fee; assessment is part of the annual license.	*There is no fee to PLTW Certified high schools.
Introduction to Engineering/ Computer Integrated Manufacturing	Computer Integrated Manufacturing (CIM)	Academic Assessment	Project Lead the Way (PLTW)	http://www.pltw.org	End of Course assessment that verifies student mastery of the knowledge and skills that provide the foundation for computer integrated manufacturing including mechanical engineering.	On Line, 45 minute-timed	Pass/Fail	*No Fee; assessment is part of the annual license.	*There is no fee to PLTW Certified high schools.

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Introduction to Engineering/ Computer Integrated Manufacturing	AutoCAD Certified User	Certification	Certiport Autodesk User	http://www.certiport.com/PORTAL/desktopdefault.aspx?tabid=667&roleid=101	Certification exam in the classroom and certifies student design software skills (2D, 3D) with recognized industry certification.	Online	Pass/Fail	*No Fee; assessment is part of the annual license.	Assessment is taken at Certiport Authorized Testing Centers (CATCs); classroom license options available for unlimited online testing.
Introduction to Engineering/ Computer Integrated Manufacturing	Autodesk Inventor Certified User Exam	Certification	Certiport Autodesk User/ Project Lead the Way	http://www.pltw.org/get-involved/student-opportunities/autodesk-%C2%AE-inventor-certified-user-exam	Certification exam in the classroom and certifies student design software skills in Inventor with recognized industry certification - for students who have completed the Introduction to Engineering Design course.	On Line, 45 minute exam	Pass/Fail	\$49 per exam voucher; voucher is valid for 12 months and includes a retake opportunity.	*For PLTW Certified high schools only. * Passing students receive a digital certificate from Autodesk.

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<div style="display: flex; justify-content: space-between;"> ● For use at POSTSECONDARY For use at POSTSECONDARY For use at POSTSECONDARY </div>									
Mechanical Design/ Drafting	Engineering Technology	Academic Assessment	SkillsUSA Work Force Ready System	http://www.workforcereadysystem.org/media/blueprints/EngineeringTechnology_blueprint.pdf	Entry-level assessment that verifies student mastery of the knowledge and skills that provide the foundation for all engineering careers.	Online; Estimated time for assessment: Approximately 1 hour	65%	\$10 per exam if SkillsUSA member; \$20 per exam	50 questions included in exam
	SkillsUSA Work Force Ready System	SkillsUSA	SITE COORDINATOR	Each institution / consortium should have a coordinator who contacts SkillsUSA to obtain assessment exams, proctoring information, data management needs, and other important functions. Your Proctor name, email address and phone number are required when ordering assessments to be administered to students.	Click below for the SkillsUSA Work Force Ready System Web site and browse the various Assessment Links and other details: http://www.workforcereadysystem.org				

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Mechanical Design/ Drafting	Pre- Engineering/ Engineering Technology	Academic Assessment	NOCTI	http://www.nocti.org/PDFs/JobReady/2475_Pre-Engineering.pdf	Job-ready assessment that verifies student mastery of the knowledge and skills that provide the foundation for pre-engineering.	Online; Estimated time for assessment: Up to 3 hours; in 1, 2, or 3 sessions	National Norm	\$19 for post- test only; \$31 for pre- test and post- test.	Job-Ready Assessment - 202 item multiple choice exam
Mechanical Design/ Drafting	Mechanical Drafting & Design	Academic Assessment	NOCTI	http://www.nocti.org/PDFs/JobReady/4038_Mechanical_Drafting.pdf	Job-ready assessment that verifies student mastery of the knowledge and skills that provide the foundation for mechanical drafting & design.	Online; Estimated time for assessment: Up to 3 hours; in 1, 2, or 3 sessions	National Norm	\$19 for post- test only; \$31 for pre- test and post- test.	Job-Ready Assessment - 202 item multiple choice exam
Mechanical Design/ Drafting	Technical Drafting	Academic Assessment	NOCTI	http://www.nocti.org/PDFs/JobReady/4054_Technical_Drafting.pdf	Job-ready assessment that verifies student mastery of the knowledge and skills that provide the foundation for technical drafting.	Online; Estimated time for assessment: Up to 3 hours; in 1, 2, or 3 sessions	National Norm	\$19 for post- test only; \$31 for pre- test and post- test.	Job-Ready Assessment - 202 item multiple choice exam
Mechanical Design/ Drafting	CAD	Academic Assessment	NOCTI	http://www.nocti.org/PDFs/JobReady/4973_CAD.pdf	Job-ready assessment that verifies student mastery of the knowledge and skills that provide the foundation for CAD.	Online; Estimated time for assessment: Up to 3 hours; in 1, 2, or 3 sessions	National Norm	\$19 for post- test only; \$31 for pre- test and post- test.	Job-Ready Assessment - 202 item multiple choice exam

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Mechanical Design/ Drafting	CAD/CAM	Academic Assessment	NOCTI	http://www.nocti.org/PDFs/JobReady/4973_CAD.pdf	Job-ready assessment that verifies student mastery of the knowledge and skills that provide the foundation for CAD/CAM.	Online; Estimated time for assessment: Up to 3 hours; in 1, 2, or 3 sessions	National Norm	\$19 for post-test only; \$31 for pre-test and post-test.	Job-Ready Assessment - 202 item multiple choice exam
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Mechanical Design/ Drafting	Drafting: Drafting Technician	Academic Assessment	Oklahoma CareerTech	http://www.okcareertech.org/educators/assessments-and-testing/testing/study-guides/study-guides-ok-works-2015-2016/DraftingSG.pdf	Broad based, entry-level assessment that verifies student mastery of the knowledge and skills that provide the foundation as a drafting technician.	Online; Estimated time for assessment: Approximately 1 hour	70%	\$12 per exam	Approximately 40 multiple-choice questions

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Mechanical Design/ Drafting	Drafting: Mechanical Drafter	Academic Assessment	CareerTech	http://www.okcareertech.org/educators/assessments-and-testing/testing/study-guides/study-guides-ok-works-2015-2016/DraftingSG.pdf	Broad based, entry-level assessment that verifies student mastery of the knowledge and skills that provide the foundation as a mechanical drafter.	Online; Estimated time for assessment: Approximately 1 hour	70%	\$12 per exam	Approximately 40 multiple-choice questions
	Careertech Testing Information for Consortia Leaders and/or High School Testing Coordinators	Careertech	TESTING AGREEMENT	Click here for the Careertech Testing Agreement form: http://www.okcareertech.org/about/state-agency/divisions/testing	Each institution/consortium should have a Testing Coordinator who contacts Careertech to obtain assessment exams, proctoring information, data management needs, and other important functions.				
Mechanical Design/ Drafting	AutoCAD Certified User	Certification	Certiport Autodesk User	http://www.certipoint.com/PORTAL/desktopdefault.aspx?tabid=667&roleid=101	Includes both academic and industry requirements designed to confirm that AutoCAD users have the marketable 2D and 3D skills that are recognized by industry .	Online	70%	*No Fee; assessment is part of the annual license.	Must be taken at Certiport Autodesk Certified Test Center

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Mechanical Design/ Drafting	AutoCAD Inventor Certified User	Certification	Certiport Autodesk User	http://www.certiport.com/PORTAL/desktopdefault.aspx?tabid=667&roleid=101	Includes both academic and industry requirements designed to confirm that AutoCAD users have the skills necessary to continue their mechanical engineering careers.	On-Line	70%	\$75 per Certified User Autodesk Exam	Must be taken at Certiport Autodesk Certified Test Center
Mechanical Design/ Drafting	Certified Drafter	Certification	ADDA	http://www.adda.org/index.php/professional-professional-certification	Includes both academic and industry requirements designed to confirm that AutoCAD users have the skills necessary to continue their mechanical engineering careers.	On-Line	70%	\$75 per Certified User Autodesk Exam	Must be taken at Certiport Autodesk Certified Test Center
Mechanical Design/ Drafting	Certified Design Drafter	Certification	ADDA	http://www.adda.org/index.php/professional-professional-certification		On-Line	70%	\$75 per Certified User Autodesk Exam	Must be taken at Certiport Autodesk Certified Test Center

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Mechanical Design/ Drafting	Certified SolidWorks Associate - Academic	Certification	SolidWorks	http://www.solidworks.com/sw/support/797/ENU_HTML.htm	Three (3) hour exam, fundamental skills test for designing basic parts and assemblies in SolidWorks; must be 18 years old at start of academic year, in the country of record.	3-hour online	70%	\$99.00	Must take certification exams through proctored SolidWorks Academic Certification Provider program.

Core Competencies

7/1/2014

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Y=Essential; N=Not Essential; O=Optional

PERFORMANCE INDICATOR	PERFORMANCE MEASURE	COMMON CORE COMPETENCIES Consensus among work group		COMMENTS
		Secondary	Post-secondary	
TOPIC 1: ACADEMIC FOUNDATIONS: Achieve additional academic knowledge and skills required to pursue the full range of career and education opportunities within a career cluster and/or career pathway.				
INDICATOR 01.01 Demonstrate language arts knowledge and skills required to pursue the full range of post-secondary education and career opportunities in Engineering & Technology - Mechanical Design/Drafting.	MEASURE 01.01.01 Model behaviors that demonstrate active listening.	Y	Y	Comment from Postsecondary: Online students may need to access additional resources.
	MEASURE 01.01.02 Organize oral and written information.	Y	Y	
	MEASURE 01.01.03 Present formal and informal speeches including discussion, information requests, and interpretation.	O	Y	
INDICATOR 01.02 Demonstrate mathematics knowledge and skills required to pursue the full range of post-secondary education and career opportunities in Engineering & Technology - Mechanical Design/Drafting.	MEASURE 01.02.01 Use math function to complete workplace tasks.	Y	Y	e.g. Apply arithmetic operations such as addition, subtraction, multiplication, and division.
	MEASURE 01.02.02 Apply data and measurements to solve a problem.	Y	Y	
	MEASURE 01.02.03 Analyze mathematical problem statements for missing and/or irrelevant data.	Y	Y	
	MEASURE 01.02.04 Construct charts/tables/graphs from functions and data.	Y	Y	e.g. Adjust presentations to audience.
	MEASURE 01.02.05 Use geometric formulas to determine areas and volumes.	Y	Y	

	MEASURE 01.02.06 Use appropriate methods to determine measurements of dimensions.	Y	Y	Comment from Business/Industry: Include both metric and decimal units. <i>e.g. Measure dimensions, spaces and structures using U.S. standard or metric units.</i>
	MEASURE 01.02.07 Conceptualize a three-dimensional form from a two-dimensional drawing to visualize proposed work.	Y	Y	
INDICATOR 01.03 Apply the concepts and processes using the guiding principles and standards of school mathematics to solve problems in Engineering & Technology - Mechanical Design/ Drafting.	MEASURE 01.03.01 Apply and create appropriate models, concepts, and processes for an assigned situation, and apply them in solving the problem.	Y	Y	<i>Depends on the focus - a minimum of applied algebra & trigonometry.</i>
	MEASURE 01.03.02 Explain the impact of assumptions, initial conditions, boundary conditions, and other constraints on problem solutions.	Y	Y	<i>Basic problem solving</i>
INDICATOR 01.04 Apply and use algebraic, geometric and trigonometric relationships, characteristics, and properties to solve problems.	MEASURE 01.04.01 Apply and use algebraic geometric and trigonometric relationships, characteristics, and properties to solve problems.	Y	Y	
	MEASURE 01.04.02 Evaluate mathematical solutions for reasonableness.	Y	Y	
	MEASURE 01.04.03 Apply appropriate data collection methods and the means of displaying data to make decisions.	Y	Y	<i>Understand, not make decisions</i>
	MEASURE 01.04.04 Apply appropriate statistical analysis methods and the means of displaying data to make decisions.	Y	O	Comment from Business/Industry: Occupationally-specific.

INDICATOR 01.05 Demonstrate the ability to select, apply, and convert systems of measurement to solve problems.	MEASURE 01.05.01 Apply concepts of statics and loads to planning.	Y	Y	
	MEASURE 01.05.02 Apply scalar and vector quantities as applied to physical systems, such as the relationship between position, velocity, and acceleration.	O	Y	Comment from Secondary: Program-specific
	MEASURE 01.05.03 Understand fundamental laws and principles relevant to Engineering & Technology - Mechanical Design/Drafting.	Y	Y	
INDICATOR 01.06 Demonstrate the ability to use Newton's Laws of Motion to analyze static and dynamic systems.	MEASURE 01.06.01 Solve a variety of problems involving mechanical, hydraulic, and pneumatic systems.	O	Y	
	MEASURE 01.06.02 Use the relationships between energy, work, and power to solve a variety of problems involving mechanical and fluid systems.	O	O	Comment from Business/Industry: Occupation-specific.
INDICATOR 01.07 Explain the relationships between scientific theory, scientific principles and laws, technology, and engineering.	MEASURE 01.07.01 Understand concepts and processes for the application of technology standards.	O	O	
	MEASURE 01.07.02 Apply the processes and concepts for science literacy relative to Engineering & Technology - Mechanical Design/ Drafting.	Y	N	
TOPIC 2: COMMUNICATIONS - Communicate clearly and effectively with reason including technical terminology and information.				
INDICATOR 02.01 Select and employ appropriate reading and communication strategies to learn and use technical concepts and vocabulary in practice.	MEASURE 02.01.01 Select the reading strategy or strategies needed to fully comprehend the technical content within a written document.	Y	Y	<i>e.g. Skimming, reading for detail, reading for meaning or critical analysis</i>
	MEASURE 02.01.02 Demonstrate use of content, technical concepts and vocabulary when analyzing information and following directions.	Y	Y	

INDICATOR 02.02 Demonstrate use of the concepts, strategies, and systems for obtaining and conveying ideas and information to enhance communication in the workplace.	MEASURE 02.02.01 Employ verbal skills when obtaining and conveying information.	Y	Y	
	MEASURE 02.02.02 Write internal and external business correspondence that conveys and/or obtains information effectively.	O	Y	Comment from Secondary/ Postsecondary: Includes technology communication (e-mails, texting, etc.) Comment from Business/Industry: Critical communications occur in multiple ways--must prepare correctly formatted letters, e-mails, and texts.
	MEASURE 02.02.03 Communicate with other team members to clarify project objectives.	Y	Y	
	MEASURE 02.02.04 Communicate effectively with diverse groups of customers and coworkers to foster positive relationships.	Y	Y	
INDICATOR 02.03 Locate, organize and reference written information from various sources to communicate with co-workers and participants.	MEASURE 02.03.01 Organize information for use in written and oral communications.	Y	Y	Comment from Secondary/ Postsecondary: Participants may be third-party stakeholders.
	MEASURE 02.03.02 Reference the sources of information.	Y	Y	
INDICATOR 02.04 Evaluate and use information resources to accomplish specific occupational tasks.	MEASURE 02.04.01 Identify and use reliable information from texts, Internet web sites, and/or technical materials to review and apply information sources for occupational tasks.	Y	Y	
INDICATOR 02.05 Use correct grammar, punctuation and terminology to write and edit documents.	MEASURE 02.05.01 Use correct grammar, spelling, punctuation, and capitalization when preparing written documents.	Y	Y	
INDICATOR 02.06 Develop and deliver formal and informal presentations using appropriate media to engage and inform audiences.	MEASURE 02.06.01 Prepare and deliver oral presentations to provide information for specific purposes and audiences.	Y	Y	
INDICATOR 02.07 Interpret verbal and nonverbal cues/behaviors to enhance communication with co-workers and clients/participants.	MEASURE 02.07.01 Interpret verbal/nonverbal behaviors when communicating with clients and co-workers.	Y	O	Comment from Business/Industry: "Nonverbal" based on checking so employee understands.

INDICATOR 02.08 Respond using active listening skills to obtain and clarify information.	MEASURE 02.08.01 Interpret a given verbal message/information and respond with clarification techniques.	Y	O	Comment from Postsecondary: Project-based expectation
INDICATOR 02.09 Exhibit public relations skills to increase internal and external customer satisfaction.	MEASURE 02.09.01 Communicate effectively to develop customer relationships.	O	Y	
INDICATOR 02.10 Use terminology commonly used in mechanical design/drafting to be successful in workplace communications.	MEASURE 02.10.01 Match terminology to workplace situations.	Y	Y	<i>e.g., Use correct terminology to convey verbal and visual cues.</i>
INDICATOR 02.11 Use communication skills and strategies to work effectively with-customers.	MEASURE 02.11.01 Deliver a presentation that explains a concept of mechanical design/drafting.	Y	Y	Comment from Secondary/ Postsecondary: Occupation-specific Comment from Business/Industry: Stress customer service and communication between coworkers.
INDICATOR 02.12 Prepare STEM (Science, Technology, Engineering & Mathematics) material in oral, written, or visual formats that provide information to an intended audience.	MEASURE 02.12.01 Use effective methods to communicate concepts of STEM to a broadly represented audience.	O	N	Comment from Secondary: Applies to STEM initiatives only at secondary level. Comment from Business/Industry: Example would be making presentations with peers.
	MEASURE 02.12.02 Effectively communicate STEM information to a select audience.	Y	N	Comment from Secondary: Applies to STEM initiatives only at secondary level.
	MEASURE 02.12.03 Apply the ability to read, interpret, and analyze STEM materials discerning the information and concepts.	Y	N	Comment from Secondary: Applies to STEM initiatives only at secondary level.
INDICATOR 02.13 Apply active listening skills to obtain or clarify information pertaining to plans, processes, projects, or designs.	MEASURE 02.13.01 Interpret messages or information provided that clarifies issues, ideas, plans, projects, or processes.	Y	Y	Comment from Postsecondary: <i>e.g. 3 A's - Attitude, attendance, and ability</i> Comment from Business/Industry: Very important in the workplace- go to work, get along with people, get to work on time.
	MEASURE 02.13.02 Respond and/or restate information that will clarify STEM techniques to be used and/or information to be applied to projects, plans, or processes.	Y	Y	Comment from Secondary: Applies to STEM initiatives only at secondary level.

TOPIC 3: PROBLEM-SOLVING AND CRITICAL THINKING - Utilize critical thinking skills to make sense of problems and persevere in solving them. Employ valid, reliable research strategies. Demonstrate creativity and innovation.

INDICATOR 03.01 Use critical thinking skills independently and in teams to solve problems and make decisions.	MEASURE 03.01.01 Critically analyze elements of a problem to develop creative solutions.	Y	Y	
	MEASURE 03.01.02 Create ideas, proposals, and solutions to evaluate problems.	Y	Y	
INDICATOR 03.02 Employ critical thinking and interpersonal skills to resolve conflicts.	MEASURE 03.02.01 Determine a variety of options/ outcomes for conflict resolution using critical thinking skills.	Y	N	Comment from Postsecondary: Not required of program completers - more supervisory
	MEASURE 03.02.02 Identify with others' feelings, needs, and concerns.	Y	N	
INDICATOR 03.03 Create and implement project plans considering available resources and requirements of a project/ problem to accomplish realistic planning in Mechanical Design/Drafting situations.	MEASURE 03.03.01 Plan, organize, schedule and manage project/job to optimize workflow and outcome.	N	O	Comment from Secondary/Postsecondary: Occupation-specific
	MEASURE 03.03.02 Meet the schedule of a project/job.	Y	Y	Comment from Secondary/Postsecondary: Occupation-specific
INDICATOR 03.04 Effectively develop and apply the skills inherent in systems engineering where requirements, configuration, integration, project management, quality assurance, and process applications are necessary.	MEASURE 03.04.01 Understand and apply the skills inherent in systems engineering where requirements, configuration, integration, project management, quality assurance, and process applications are necessary.	Y	N	Comment from Business/Industry: Employer-specific.
	MEASURE 03.04.02 Understand and apply the skills required in project management to track and assess the progress of a plan, process, or project as assigned.	Y	N	Comment from Business/Industry: Employer-specific.
	MEASURE 03.04.03 Understand and apply the skills in quality assurance as well as those in process management and development for appropriate applications of systems integration techniques to an assigned project.	Y	N	Comment from Business/Industry: Employer-specific.

INDICATOR 03.05 Use STEM (Science, Technology, Engineering, & Mathematics) concepts and processes to solve problems in projects involving design.	MEASURE 03.05.01 Analyze working plans, processes, and projects as assigned.	Y	O	
	MEASURE 03.05.02 Identify and apply the appropriate tools to solve problems.	Y	Y	
	MEASURE 03.05.03 Disseminate information using a variety of communication technologies.	Y	Y	
	MEASURE 03.05.04 Use computer applications to solve problems through simulation and modeling techniques.	Y	Y	

TOPIC 4: TECHNOLOGY APPLICATIONS - Use technology to enhance productivity.

INDICATOR 04.01 Use personal information management applications to increase workplace efficiency.	MEASURE 04.01.01 Manage personal schedules.	Y	Y	Comment from Postsecondary: Student-specific
INDICATOR 04.02 Operate electronic mail applications to communicate within a workplace.	MEASURE 04.02.01 Use email to share files and documents.	Y	Y	Comment from Postsecondary: Student-specific
	MEASURE 04.02.02 Use email to communicate within and across organizations.	Y	Y	Comment from Postsecondary: Student-specific
INDICATOR 04.03 Operate Internet applications to perform workplace tasks.	MEASURE 04.03.01 Access and navigate Internet (e.g., use a web browser).	Y	Y	Comment from Postsecondary: Student-specific
	MEASURE 04.03.02 Search for information and resources.	Y	Y	Comment from Postsecondary: Student-specific
INDICATOR 04.04 Operate writing and publishing applications to prepare business communications.	MEASURE 04.04.01 Create memos and notes in a professional manner.	Y	Y	Comment from Postsecondary: Student-specific Comment from Business/Industry: Meeting minutes, notes, and reports with graphics.
	MEASURE 04.04.02 Prepare reports and other business communications by integrating graphics and other non-text elements.	Y	Y	Comment from Postsecondary: Student-specific Comment from Business/Industry: Suggested applications include graphics, spreadsheet, and presentation software.

INDICATOR 04.05 Operate presentation applications to prepare presentations.	MEASURE 04.05.01 Deliver presentations with supporting materials.	Y	Y	Comment from Postsecondary: Student-specific Comment from Business/Industry: Occupation-specific
INDICATOR 04.06 Employ electronic devices to manage work tasks.	MEASURE 04.06.01 Operate e-devices (i.e. computer) for workplace applications.	Y	Y	Comment from Postsecondary: Student-specific
INDICATOR 04.07 Effectively use information technology (IT) tools to gather, store, and communicate data in appropriate formats.	MEASURE 04.07.01 Use IT tools in support of gathering, storage, and transfer of data or results in appropriate formats to support assigned projects.	Y	Y	Comment from Postsecondary: Student-specific
	MEASURE 04.07.02 Select and use assorted forms of IT to meet the requirements of a plan, process, project, report, issue, or problem.	Y	Y	Comment from Postsecondary: Student-specific
INDICATOR 04.08 Evaluate and use skills relating to the differing technological tools used to manipulate, report, or operate with data acquisition.	MEASURE 04.08.01 Use IT tools to manipulate data creating reports, plans, processes, or projects from data provided.	Y	Y	Comment from Postsecondary: Student-specific
	MEASURE 04.08.02 Use modeling, simulation, or visual reproduction to effectively analyze, create, and/or communicate to others regarding plans, projects, problems, issues or processes.	Y	Y	Comment from Postsecondary: Student-specific
	MEASURE 04.08.03 Apply currently applicable computer software to a process, project, plan, or issue as assigned.	O	Y	Comment from Postsecondary: Student-specific
	MEASURE 04.08.04 Understand statistical tools that verify the reliability or validity of the data used or collected in the plan, project, process, or problem.	Y	O	<i>e.g. statistical process control</i> Comment from Postsecondary: Student-specific

MEASURE 04.08.05 Apply a technological, scientific, or mathematical concept (use of algorithms) when communicating with others on issues, plans, processes, problems, or concepts.	Y	N	
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TOPIC 5: ORGANIZATIONAL AND GLOBAL SYSTEMS – Understand the environmental, social, and economic impacts of decisions within an organization. Understand global context of industries and careers.

INDICATOR 05.01 Analyze and summarize the various roles and major business functions involved in a manufacturing organization as a way to demonstrate understanding of the industry as a system	MEASURE 05.01.01 Summarize past and present trends related to the mission of manufacturing organizations.	O	Y	
	MEASURE 05.01.02 Compare and contrast the various roles manufacturing organizations take on within all aspects of the industry.	O	Y	
	MEASURE 05.01.03 Compare and contrast the various roles played by critical customers, suppliers, and stakeholders within a manufacturing organization.	O	Y	
	MEASURE 05.01.04 Summarize the major competitive challenges faced by manufacturing organizations in the industry today and in the future.	O	Y	
	MEASURE 05.01.05 Summarize the various major internal job functions and organizational structures found among manufacturing organizations.	O	Y	

TOPIC 6: SAFETY, HEALTH, AND ENVIRONMENT – Understand the importance of safety, health, and environmental management systems and their importance to organizational performance and regulatory compliance.

INDICATOR 06.01 Develop an awareness of safety, health, and environmental hazards when solving problems, developing plans, processes, or completing projects to be proactive in promoting safety.	MEASURE 06.01.01 Use appropriate safety techniques, equipment, and processes in planning and /or project applications.	Y	Y	
	MEASURE 06.01.02 Identify existing or potential hazards to existing or assigned plans, projects, or processes where safety, health, or environment might be in play.	Y	Y	

TOPIC 7: LEADERSHIP AND TEAMWORK - Use leadership in collaborating with others to accomplish productive organizational goals and objectives with an awareness of cultural/global competence.

INDICATOR 07.01 Establish and maintain effective working relationships with all levels of personnel and other departments in order to accomplish objectives and tasks.	MEASURE 07.01.01 Build effective working relationships using interpersonal skills.	Y	Y	Comment from Business/Industry: Encourage collaboration.
	MEASURE 07.01.02 Use positive interpersonal skills to work cooperatively with co-workers representing different cultures, genders, and backgrounds.	Y	Y	Comment from Business/Industry: Build rapport with co-workers.
	MEASURE 07.01.03 Manage personal skills to accomplish assignments.	Y	Y	
	MEASURE 07.01.04 Treat people with respect.	Y	Y	
INDICATOR 07.02 Establish specific goals to manage project assignments in a timely manner.	MEASURE 07.02.01 Manage project assignments in a timely manner.	Y	Y	
	MEASURE 07.02.02 Organize work teams that effectively manage assignments.	O	O	Comment from Secondary/ Postsecondary: Occupation-specific
INDICATOR 07.03 Manage relationships with internal and external parties to successfully complete construction projects.	MEASURE 07.03.01 Plan and organize project meetings.	O	O	Comment from Secondary/ Postsecondary: Occupation-specific

ESS07.04 Employ work skills to achieve collective goals and use team members' talents effectively.	ESS07.04.01 Identify best practices for successful team functioning.	N	O	
	ESS07.04.02 Work with others to achieve objectives in a timely manner.	Y	Y	
ACPA07.05 Appreciate the diversity of needs, values and social patterns in project design to appropriately meet client needs.	ACPA07.05.01 Identify the geographic and cultural issues related to project design in a given situation.	Y	Y	<i>i.e. Apply cultural traditions and diversity to project design.</i>
	ACPA07.05.02 Participate in appropriate trade and professional associations.	O	O	

TOPIC 8: ETHICS AND LEGAL RESPONSIBILITIES –Know, understand, and model the importance of ethics, integrity, and legal responsibilities.

INDICATOR 08.01 Apply ethical reasoning to a variety of workplace situations in order to make ethical decisions.	MEASURE 08.01.01 Evaluate alternative responses to workplace situations based on personal or professional ethical responsibilities.	Y	Y	
	MEASURE 08.01.02 Identify personal and long-term workplace consequences of unethical or illegal behaviors.	Y	Y	
	MEASURE 08.01.03 Determine the most appropriate response to workplace situations based on legal and ethical considerations.	Y	Y	
INDICATOR 08.02 Develop the knowledge and abilities to comprehend ethical and legal standards where plans, processes, and projects will be dependent upon them.	MEASURE 08.02.01 Comply with ethical standards and professional codes.	Y	Y	

TOPIC 9: CAREER DEVELOPMENT, EMPLOYABILITY, AND CITIZENSHIP –Attend to personal health and financial well-being. Know and understand the importance of employability skills. Plan education and career paths aligned to personal goals and employability goals. Act as a responsible and contributing citizen and employee.

INDICATOR 09.01 Identify and demonstrate positive work behaviors and personal qualities needed to be employable.	MEASURE 09.01.01 Demonstrate self-discipline, self-worth, positive attitude, and integrity in a work situation.	Y	Y	
	MEASURE 09.01.02 Demonstrate flexibility and willingness to learn new knowledge and skills.	Y	Y	
INDICATOR 09.02 Develop a personal career plan to meet career goals and objectives.	MEASURE 09.02.01 Develop career goals and objectives as part of a plan for future career direction.	Y	O	
	MEASURE 09.02.02 Develop strategies to reach career objectives.	Y	O	
INDICATOR 09.03 Demonstrate skills related to seeking and applying for employment to find and obtain a desired job.	MEASURE 09.03.01 Prepare a resume.	O	Y	Comment from Business/Industry: Employers recognize the importance of pre-employment activities.
	MEASURE 09.03.02 Interview for employment.	O	Y	
	MEASURE 09.03.03 Demonstrate job seeking skills to find and obtain a desired position.	O	Y	
INDICATOR 09.04 Maintain a career portfolio to document knowledge, skills and experience in a career field.	MEASURE 09.04.01 Organize electronic or physical portfolio for use in demonstrating knowledge, skills and experiences.	Y	Y	Comment from Business/Industry: Employers recognize the importance of education portfolios.
INDICATOR 09.05 Continue professional development to keep current on relevant trends and information within the industry.	MEASURE 09.05.01 Participate in user groups and participate in professional organizations.	O	Y	
	MEASURE 09.05.02 Read trade magazines and journals, manufacturers' catalogues, industry publications and internet sites to keep current on industry trends.	N	Y	
INDICATOR 09.06 Use planning and time management skills and tools to enhance results and complete work tasks.	MEASURE 09.06.01 Prioritize tasks to be completed.	Y	Y	

INDICATOR 09.07 Recognize the responsibilities and personal characteristics to develop individual goals for professionalism.	MEASURE 09.07.01 Present a professional image in the workplace/jobsite.	Y	Y	
INDICATOR 09.08 Develop the skills and abilities to research career pathways in STEM.	MEASURE 09.08.01 Engage experiences in STEM where an individual can identify personal interests and expectations for career and personal development.	Y	N	Comment from Secondary: Very important for education to help students explore career pathways in STEM including Engineering & Technology - Mechanical Design/Drafting while in high school.

TOPIC 10: TECHNICAL LITERACY – Apply technical knowledge and skills required to pursue careers in a specific career cluster and/or career pathway.

INDICATOR 10.01 Read and employ technical drawings, documents, and specifications to plan a project.	MEASURE 10.01.01 Interpret engineering drawings.	Y	Y	<i>e.g., Recognize elements and symbols of drawings.</i>
	MEASURE 10.01.02 Apply industry standards and specifications.	Y	Y	<i>e.g., Read, explain, and apply standards and specifications.</i> Comment from Postsecondary: Examples also include revising, tolerance, finishing marks, dimensioning, bill of materials, and interpreting original drawings.
	MEASURE 10.01.03 Use engineering drawings, manufacturer's illustrations and other materials to communicate specific data and visualize proposed work.	Y	Y	Comment from Postsecondary: Examples include technical illustrations, isometric drawings, capstone design projects/portfolio
INDICATOR 10.02 Use appropriate representational media to communicate concepts and designs.	MEASURE 10.02.01 Convey graphic information using multi-view drawings.	Y	Y	Comment from Postsecondary: Examples include orthographic, isometric geometric construction, assembly section views, sketching, auxiliary views.
	MEASURE 10.02.02 Create three dimensional models--digital and/or physical.	Y	Y	Comment from Postsecondary: Examples include software such as 2D CAD, 3D modeling.
	MEASURE 10.02.03 Utilize computer technology when communicating concepts and designs.	Y	Y	<i>e.g., Employ drafting modeling techniques.</i>

INDICATOR 10.03 Employ time management skills and tools to enhance results and complete work tasks.	MEASURE 10.03.01 Prioritize tasks to be completed.	Y	Y	Comment from Secondary: Important skill to emphasize with students at secondary level.
	MEASURE 10.03.02 Complete work tasks.	Y	Y	Comment from Secondary: Important skill to emphasize with students at secondary level.
Foundations of Mechanical Design/Drafting				
INDICATOR 10.04 Apply concepts and processes for the application of technology to Mechanical Design/Drafting.	MEASURE 10.04.01 Use knowledge, techniques, skills, and modern tools necessary for Mechanical Design/Drafting.	Y	Y	
	MEASURE 10.04.02 Understand effective organizational skills, understanding resources, continuous improvement, working with teams, and time management.	Y	Y	
	MEASURE 10.04.03 Use and apply the appropriate tools and instruments for assigned tasks.	Y	Y	
INDICATOR 10.05 Develop processes and concepts for the use of technology which model technical competence.	MEASURE 10.05.01 Use probes, sensors, measuring systems, and devices to collect data using traceable standards.	O	Y	Comment from Secondary: Program-specific
	MEASURE 10.05.02 Safely operate all equipment used within assigned task.	Y	Y	
	MEASURE 10.05.03 Use, handle, and store tools and materials correctly, perform preventative maintenance, understanding the results of negligence and improper maintenance or improper calibration.	Y	Y	
Foundations of Design				
INDICATOR 10.06 Apply manufacturing concepts and processes.	MEASURE 10.06.01 Know the concepts for understanding the design process.	O	Y	Comment from Postsecondary: Capstone design project - sheet metal, fasteners, power transmission
	MEASURE 10.06.02 Apply drawing and design components to the manufacturing concepts and processes.	Y	Y	

	MEASURE 10.06.03 Describe design constraints, criteria, and trade-offs in regard to variety of conditions (e.g. technology, cost, safety, society, the environment, time, human resources, manufacturability).	Y	Y	Comment from Postsecondary: Design for manufacturing (DFM) and Just-in-time (JIT)
INDICATOR 10.07 Develop processes and concepts to apply to the design process	MEASURE 10.07.01 Explain the design process, including understanding customer needs, interpreting and producing design constraints and criteria, planning and requirements analysis, brainstorming and idea generation, using appropriate modeling and prototyping testing, verification and implementation.	Y	Y	
	MEASURE 10.07.02 Demonstrate the ability to evaluate a design or product and improve the design using testing, modeling and research.	Y	Y	
	MEASURE 10.07.03 Demonstrate the ability to record and organize information and test data during design evaluation.	Y	O	
Foundations of Engineering Systems				
INDICATOR 10.08 Identify and apply simple machines.	MEASURE 10.08.01 Demonstrate the ability to determine mechanical advantage of various mechanical systems.	Y	Y	
	MEASURE 10.08.02 Apply simple machines in various systems.	Y	Y	
INDICATOR 10.09 Identify, test and apply basic electrical/ electronic systems.	MEASURE 10.09.01 Demonstrate a functional knowledge of basic electrical/ electronic/ control symbols and schematics.	Y	O	Comment from Postsecondary: Industry & program-specific
	MEASURE 10.09.02 Apply the principles of Ohm's law, series and parallel circuits, and Watt's Law.	Y	O	Comment from Postsecondary: Industry & program-specific

INDICATOR 10.10 Identify and apply hydraulic/pneumatic power systems.	MEASURE 10.10.01 Apply simple hydraulic/pneumatic power systems for mechanical advantage.	Y	O	Comment from Postsecondary: Industry & program-specific
Foundations of Statics				
INDICATOR 10.11 Identify and define engineering statics.	MEASURE 10.11.01 Define stress and strain as it relates to stationary structures.	Y	O	
	MEASURE 10.11.02 Define load as it relates to specific structure examples.	Y	O	<i>e.g. Bridge</i>
	MEASURE 10.11.03 Define moment of inertia as it relates to specific examples.	O	O	Comment from Secondary: Program-specific
	MEASURE 10.11.04 Conduct vector analysis	O	O	Comment from Secondary: Program-specific
Foundations of Material and Materials Testing in Engineering				
INDICATOR 10.12 Explain and test specific material categories used in engineering and technology.	MEASURE 10.12.01 Determine physical properties as it relates to specific materials.	O	O	
	MEASURE 10.12.02 Conduct destructive and non-destructive material testing.	O	O	
	MEASURE 10.12.03 Determine material failures.	O	O	
Foundations of Dynamics/Kinematics				
INDICATOR 10.13 Identify dynamics/kinematics.	MEASURE 10.13.01 Define velocity and displacement	O	O	Comment from Business/Industry: Industry-specific: essential for design; optional for drafting.
	MEASURE 10.13.02 Demonstrate knowledge of linear motion and acceleration.	O	O	Comment from Business/Industry: Industry-specific: essential for design; optional for drafting.
	MEASURE 10.13.03 Demonstrate knowledge of trajectory motion.	O	O	Comment from Business/Industry: Industry-specific: essential for design; optional for drafting.

TOPIC 11: LEAN MANUFACTURING/ PRODUCTION: Use of knowledge, skills and tools required to increase efficiencies, decrease waste and using empirical methods to decide what matters to improve quality and reduce total costs in a manufacturing/engineering process.

INDICATOR 11.01 Identify the history of Lean Manufacturing/ Production principles	MEASURE 11.01.01 Identify what it means to add value to a product from a customer perspective. (Define flexibility, standardization, inconsistency and waste.)	O	O	Comment from Secondary: Program-specific Comment from Business/Industry: Industry-specific: essential for design; optional for drafting.
	MEASURE 11.01.02 Explain the concepts of Just In Time (JIT)	O	O	Comment from Secondary: Program-specific Comment from Business/Industry: Industry-specific: essential for design; optional for drafting.
INDICATOR 11.02 Identify/ eliminate waste to improve manufacturing or production process.	MEASURE 11.02.01 Explain the 7 "wastes" of manufacturing. IE: Needless Transport, Excess Inventory, Wastes Motion, Waiting, Overproduction, Over Processing, Defects as they relate to continuous improvement (TIMWOOD)	O	O	Comment from Secondary: Program-specific Comment from Business/Industry: Industry-specific: essential for design; optional for drafting.
INDICATOR 11.03 Identify continuous improvement processes	MEASURE 11.03.01 Explain employee/team participation in any continuous improvement process. (Define efficiency, effectiveness and flexibility.)	O	O	Comment from Secondary: Program-specific Comment from Business/Industry: Industry-specific: essential for design; optional for drafting.
INDICATOR 11.04 Identify Lean Manufacturing/ Production Processes.	MEASURE 11.04.01 Explain employee/team participation in Lean Manufacturing/ Production as it relates to continuous improvement.	O	O	Comment from Secondary: Program-specific Comment from Business/Industry: Industry-specific: essential for design; optional for drafting.
INDICATOR 11.05 Identify ISO 9000/9001	MEASURE 11.05.01 Explain ISO9000 family of standards as it relates to quality management systems.	N	O	Comment from Secondary: Program-specific Comment from Business/Industry: Industry-specific: essential for design; optional for drafting.
	MEASURE 11.05.02 Explain the requirements that organizations must meet to qualify for the ISO 9001 standards.	N	O	Comment from Secondary: Program-specific Comment from Business/Industry: Industry-specific: essential for design; optional for drafting.

Technical Skill Assessment Blueprint

7/1/2014

Pathway: Engineering & Technology - Mechanical Design/ Drafting

Cluster: Science, Technology, Engineering, & Mathematics

An "assessment blueprint" is a document that indicates the knowledge and skills that will be covered in an assessment instrument and the percentage of the assessment that will be devoted to each area of knowledge and skills. The Minnesota assessment blueprints will be used to review the appropriateness of existing assessments by determining how closely those assessments match up to what the Engineering & Technology - Mechanical Design/ Drafting career pathway working groups have determined should be assessed. The assessment blueprints can also be used to guide the development of new assessments where suitable third-party assessments do not exist.

		SECONDARY	POST-SECONDARY	BUSINESS & INDUSTRY
		% of Assessment ↓	% of Assessment ↓	% of Assessment ↓
TOPIC 1	ACADEMIC FOUNDATIONS: Achieve additional academic knowledge and skills required to pursue the full range of career and education opportunities within a career cluster and/or career pathway.	15%	6%	6%
TOPIC 2	COMMUNICATIONS - Communicate clearly and effectively with reason including technical terminology and information.	14%	6%	6%
TOPIC 3	PROBLEM-SOLVING AND CRITICAL THINKING - Utilize critical thinking skills to make sense of problems and persevere in solving them. Employ valid, reliable research strategies. Demonstrate creativity and innovation.	11%	7%	11%
TOPIC 4	TECHNOLOGY APPLICATIONS - Use technology to enhance productivity.	9%	5%	6%
TOPIC 5	ORGANIZATIONAL AND GLOBAL SYSTEMS – Understand the environmental, social, and economic impacts of decisions within an organization. Understand global context of industries and careers.	5%	1%	4%
TOPIC 6	SAFETY, HEALTH, AND ENVIRONMENT – Understand the importance of safety, health, and environmental management systems and their importance to organizational performance and regulatory compliance.	6%	1%	2%
TOPIC 7	LEADERSHIP AND TEAMWORK - Use leadership in collaborating with others to accomplish productive organizational goals and objectives with an awareness of cultural/global competence.	4%	6%	6%
TOPIC 8	ETHICS AND LEGAL RESPONSIBILITIES – Know, understand, and model the importance of ethics, integrity, and legal responsibilities.	7%	3%	3%
TOPIC 9	CAREER DEVELOPMENT, EMPLOYABILITY, AND CITIZENSHIP –Attend to personal health and financial well-being. Know and understand the importance of employability skills. Plan education and career paths aligned to personal goals and employability goals. Act as a responsible and contributing citizen and employee.	5%	5%	4%
TOPIC 10	TECHNICAL LITERACY – Apply technical knowledge and skills required to pursue careers in a specific career cluster and/or career pathway.	24%	60%	52%
		100%	100%	100%

Science, Technology, Engineering, & Mathematics - Engineering & Technology - Mechanical Design/Drafting Career Pathway

Career Pathway Plan of Study for ► Learners ► Parents ► Counselors ► Teachers/Faculty--Effective Graduates 2015 & Beyond

This Career Pathway Plan of Study (based on the Engineering & Technology - Mechanical Design/ Drafting) can serve as a guide, along with other career planning materials, as learners continue on a career path. Courses listed within this plan are only recommended coursework and should be individualized to meet each learner’s educational and career goals. This Plan of Study, used for learners at an educational institution, should be customized with course titles and appropriate high school graduation requirements as well as college entrance requirements.

EDUCATION LEVELS	GRADE	English/ Language Arts	Math	Science	Social Studies/ Sciences	Other Required Courses Other Electives Recommended Electives Learner Activities	*Career and Technical Courses and/or Degree Major Courses for Engineering & Technology - Mechanical Design/ Drafting Career Pathway	SAMPLE Occupations Relating to This Pathway
<i>Interest Inventory Administered and Plan of Study Initiated for all Learners</i>								
SECONDARY	9	English/ Language Arts I	Geometry	Earth or Life or Physical Science	Government & Citizenship/ Geography	All plans of study should meet local and state high school graduation requirements and college entrance requirements. Certain local student organization activities such as SkillsUSA or FFA are also important.	<ul style="list-style-type: none"> • Introduction to Engineering Design • Principles of Engineering • Mechanical Drafting I 	Occupations Requiring Postsecondary Education: <ul style="list-style-type: none"> ► CAD Technician ► Engineering & Related Technician ► Engineering & Related Technologist ► Manufacturing Technician ► Mechanical Designer ► Mechanical Drafter ► Operations Manager ► Precision Inspector, Tester & Grader ► Process Improvement Technician ► Production Manager ► Quality Control Technician ► Purchasing Agent ► Supervisor
	10	English/ Language Arts II	Algebra II	Biology	U.S. History		<ul style="list-style-type: none"> • Computer Integrated Manufacturing • Mechanical Drafting II 	
	11	English/ Language Arts III	Probability and Statistics	Chemistry or Physics or CTE Science Equivalent	World History		<ul style="list-style-type: none"> • Computer Science • Principles of Engineering • Aerospace Engineering • Any Technical Education in engineering, electronics, or robotics 	
	<i>College Placement Assessments-Academic/Career Advisement Provided</i>						<ul style="list-style-type: none"> • Biotechnical Engineering • Civil Engineering & Architecture • Digital Electronics • Engineering Design & Development • Internship/ Mentorship 	
	12	English/ Language Arts IV	Math Elective (i.e. CTE Math Equivalent)	Science Elective	Economics			Occupations Requiring a Baccalaureate or Graduate Degree or Work Experience <ul style="list-style-type: none"> ► Design Engineer ► Electronics Engineer ► Industrial Engineer ► Manufacturing Engineer
<i>Articulation/Dual Credit Transcribed-Postsecondary courses may be taken/moved to the secondary level for articulation/dual credit purposes.</i>								
POSTSECONDARY	College Year 1	Required Transfer Curriculum Goals Determined by Local College Program in College Year 1 and Year 2: Goal 1: Communication; Goal 2: Critical Thinking/Problem-Solving; Goal 3: Natural Science; Goal 4: Mathematical/Logical Reasoning; Goal 5: History and the Social and Behavior Sciences; Goal 6: The Humanities and the Arts; Goal 7: Human Diversity; Goal 8: Global Perspective; Goal 9: Ethical and Civic Responsibility; Goal 10: People and the Environment				All plans of study need to meet learners’ career goals with regard to required degrees, licenses, or certifications. Certain local student organization activities such as SkillsUSA may also be important to include.	<ul style="list-style-type: none"> • Core Classes Specific to Program (Ex. Engineering Drawing I, CAD I) 	
	College Year 2						<ul style="list-style-type: none"> • Advanced Classes Specific to Program (Ex. Engineering Drawing II, CAD II) 	
	Year 3	Continue courses in the area of specialization.					<ul style="list-style-type: none"> • Continue Courses in the Area of Specialization 	
	Year 4						<ul style="list-style-type: none"> • Complete Engineering Major (4-year degree program) 	