CURRICULUM

Automation

Thomas Jefferson High School

Curriculum Strand: Measurement

PA Academic Standards Student must be able to do	**Objective** Content or process student will be able to know and do	**Instructional Methods**	**Materials/ Resources** Textbooks, workbooks, software, hardware, etc	***Assessment Procedures** *Additional adaptations, modification, accommodations, and enrichment/ acceleration will be provided per IEP	***Additional Learning** Opportunities for students who do not meet basic standards *Additional adaptations, modifications, and accommodations will be provided per IEP	***Extended Learning** Opportunities for students who can go beyond the basic standards. *Additional enrichment/ acceleration will be provided per IEP
3.1.10 D Apply scale as a way of relating concepts and ideas to one another by some measure. 3.1.12 D Analyze scale as a way of relating concepts and ideas to one another by some measure. 3.7.10 B Apply appropriate instruments and apparatus to examine a variety of objects and processes.	• Demonstrate an understanding of the customary scale to the 1/16” • Demonstrate an understanding of the metric scale • Apply the use of various measuring tools for both the customary and metric scale	• Direct Instruction • Group Work • Hands-on Work • Demonstrations • Cooperative Learning • Class Discussions • Note Taking • Video	• Activity Packets • Worksheets • Measuring Devices • Computer .	• Teacher Observation • Tests • Quizzes • Problem Solving • In-Class Work • Write-ups • Projects • Critical Thinking • Rubric • Peer Evaluation • Q/A	• Extended Time • Tutoring • Technology • Adapted Lessons • Access to Learning Support • Review and Re-teach • Peer Interaction • Group Instruction	• Additional Projects • More In-depth Projects • Technology Competition • Peer Instruction • Independent Research Projects • Field Trips

CURRICULUM

Automation

Thomas Jefferson High School

Curriculum Strand: Current Trends in Automation Technology

PA Academic Standards Student must be able to do	**Objective** Content or process student will be able to know and do	**Instructional Methods**	**Materials/ Resources** Textbooks, workbooks, software, hardware, etc	***Assessment Procedures** *Additional adaptations, modification, accommodations, and enrichment/ acceleration will be provided per IEP	***Additional Learning** Opportunities for students who do not meet basic standards *Additional adaptations, modifications, and accommodations will be provided per IEP	***Extended Learning** Opportunities for students who can go beyond the basic standards. *Additional enrichment/ acceleration will be provided per IEP
3.7.10 C Apply basic computer operations and concepts. 3.8.10 A Analyze the relationship between societal demands and scientific and technological enterprises. 3.8.12 A Synthesize and evaluate the interactions and constraints of science and technology on society. 3.8.10 B Analyze how human ingenuity and technological resources satisfy specific human needs and improve the quality of life. 3.8.12 B Apply the use of ingenuity and technological resources to solve specific societal needs and improve the quality of life.	• Identify new innovations, inventions associated with automation technology today • Analyze current issues relating to automation in industry today • Identify safety concerns and issues in automation technology • Develop a research paper relating to the issues discussed relating to automation technology. • Identify careers relating to automation technology	• Direct Instruction • Hands-on Work • Internet Research • Cooperative Learning • Brainstorming • Class Discussions • Note Taking • Independent Design and Development • Video	• Computer .	• Teacher Observation • In-Class Work • Write-ups • Projects • Critical Thinking • Essays • Rubric • Peer Evaluation • Q/A	• Extended Time • Tutoring • Technology • Adapted Lessons • Access to Learning Support • Review and Re-teach • Peer Interaction • Group Instruction	• Additional Projects • More In-depth Projects • Technology Competition • Peer Instruction • Independent Research Projects • Field Trips

CURRICULUM

Automation

Thomas Jefferson High School

Curriculum Strand: CNC Programming

PA Academic Standards Student must be able to do	**Objective** Content or process student will be able to know and do	**Instructional Methods**	**Materials/ Resources** Textbooks, workbooks, software, hardware, etc	***Assessment Procedures** *Additional adaptations, modification, accommodations, and enrichment/ acceleration will be provided per IEP	***Additional Learning** Opportunities for students who do not meet basic standards *Additional adaptations, modifications, and accommodations will be provided per IEP	***Extended Learning** Opportunities for students who can go beyond the basic standards. *Additional enrichment/ acceleration will be provided per IEP
3.7.10 A Identify and safely use a variety of tools, basic machines, materials and techniques to solve problems and answer questions. 3.7.12 A Apply advanced tools, materials and techniques to answer complex questions. 3.7.10 C Apply basic computer operations and concepts. 3.7.10 D Utilize computer software to solve specific problems.	• Define CNC and related terms • Identify, describe, and discuss the history of CNC and other uses of computers in industry • Identify and discuss the role of automation in industry today • Develop an understanding for writing CNC programs to perform specific tasks • Write several programs to perform specific tasks with the CNC mill and Lathe	• Direct Instruction • Group Work • Hands-on Work • Demonstrations • Internet Research • Cooperative Learning • Brainstorming • Class Discussions • Note Taking • Independent Design and Development • Video	• Activity Packets • Worksheets • Calculators • Measuring Devices • Computer • CAM Software • CNC Equipment .	• Teacher Observation • Tests • Quizzes • Problem Solving • In-Class Work • Write-ups • Portfolio Check • Projects • Critical Thinking • Essays • Rubric • Peer Evaluation • Q/A	• Extended Time • Tutoring • Technology • Adapted Lessons • Access to Learning Support • Review and Re-teach • Peer Interaction • Group Instruction	• Additional Projects • More In-depth Projects • Technology Competition • Peer Instruction • Independent Research Projects • Field Trips

CURRICULUM

Automation

Thomas Jefferson High School

Curriculum Strand: CAD Software

PA Academic Standards Student must be able to do	**Objective** Content or process student will be able to know and do	**Instructional Methods**	**Materials/ Resources** Textbooks, workbooks, software, hardware, etc	***Assessment Procedures** *Additional adaptations, modification, accommodations, and enrichment/ acceleration will be provided per IEP	***Additional Learning** Opportunities for students who do not meet basic standards *Additional adaptations, modifications, and accommodations will be provided per IEP	***Extended Learning** Opportunities for students who can go beyond the basic standards. *Additional enrichment/ acceleration will be provided per IEP
3.6.10 B Apply knowledge of information technologies of encoding, transmitting, receiving, storing, retrieving and decoding. 3.7.10 C Apply basic computer operations and concepts. 3.7.10 D Utilize computer software to solve specific problems.	• Identify the basic operations of CAD software • Identify the procedures for setting up drawings using CAD software • Design and develop several CAD drawings to be created using various CNC software • Identify procedures for plotting out drawings	• Direct Instruction • Group Work • Hands-on Work • Demonstrations • Internet Research • Cooperative Learning • Brainstorming • Class Discussions • Note Taking • Independent Design and Development • Video	• Activity Packets • Worksheets • Calculators • Measuring Devices • Computer • AutoCAD • CAM Software • CNC Equipment .	• Teacher Observation • Tests • Quizzes • Problem Solving • In-Class Work • Write-ups • Portfolio Check • Projects • Critical Thinking • Essays • Rubric • Peer Evaluation • Q/A	• Extended Time • Tutoring • Technology • Adapted Lessons • Access to Learning Support • Review and Re-teach • Peer Interaction • Group Instruction	• Additional Projects • More In-depth Projects • Technology Competition • Peer Instruction • Independent Research Projects • Field Trips

CURRICULUM

Automation

Thomas Jefferson High School

Curriculum Strand: Computer Aided Manufacturing

PA Academic Standards Student must be able to do	**Objective** Content or process student will be able to know and do	**Instructional Methods**	**Materials/ Resources** Textbooks, workbooks, software, hardware, etc	***Assessment Procedures** *Additional adaptations, modification, accommodations, and enrichment/ acceleration will be provided per IEP	***Additional Learning** Opportunities for students who do not meet basic standards *Additional adaptations, modifications, and accommodations will be provided per IEP	***Extended Learning** Opportunities for students who can go beyond the basic standards. *Additional enrichment/ acceleration will be provided per IEP
3.2.10 D Identify and apply the technological design process to solve problems. 3.6.10 B Apply knowledge of information technologies of encoding, transmitting, receiving, storing, retrieving and decoding. 3.7.10 A Identify and safely use a variety of tools, basic machines, materials and techniques to solve problems and answer questions. 3.7.10 C Apply basic computer operations and concepts. 3.7.10 D Utilize computer software to solve specific problems.	• Define CAM and related terms • Identify the purpose for and uses of CAM in industry today • Identify procedures for developing parts using both CAD and CAM software • Apply CAD and CAM skills in developing several parts • Develop several parts using CAD and CAM software to solve specified problems	• Direct Instruction • Group Work • Hands-on Work • Demonstrations • Internet Research • Cooperative Learning • Brainstorming • Class Discussions • Note Taking • Independent Design and Development • Video	• Activity Packets • Worksheets • Calculators • Measuring Devices • Computer • AutoCAD • CAM Software • CNC Equipment	• Teacher Observation • Tests • Quizzes • Problem Solving • In-Class Work • Write-ups • Portfolio Check • Projects • Critical Thinking • Essays • Rubric • Peer Evaluation • Q/A	• Extended Time • Tutoring • Technology • Adapted Lessons • Access to Learning Support • Review and Re-teach • Peer Interaction • Group Instruction	• Additional Projects • More In-depth Projects • Technology Competition • Peer Instruction • Independent Research Projects • Field Trips

CURRICULUM

Automation

Thomas Jefferson High School

Curriculum Strand: Robotics Technology

PA Academic Standards Student must be able to do	**Objective** Content or process student will be able to know and do	**Instructional Methods**	**Materials/ Resources** Textbooks, workbooks, software, hardware, etc	***Assessment Procedures** *Additional adaptations, modification, accommodations, and enrichment/ acceleration will be provided per IEP	***Additional Learning** Opportunities for students who do not meet basic standards *Additional adaptations, modifications, and accommodations will be provided per IEP	***Extended Learning** Opportunities for students who can go beyond the basic standards. *Additional enrichment/ acceleration will be provided per IEP
3.2.10 D Identify and apply the technological design process to solve problems. 3.6.10 C Apply physical technologies of structural design, analysis and engineering, personnel relations, financial affairs, structural production, marketing, research and design to real world problems. 3.7.10 A Identify and safely use a variety of tools, basic machines, materials and techniques to solve problems and answer questions.	• Describe robotics technology and associated terms • Evaluate the purpose for and use of robotics technology in society today • Identify several careers relating to robotics technology • Identify a specified problem that can be solved using a robot • Identify and describe the tools, materials, and concepts needed to develop a robot • Construct a robot to perform a specified function	• Direct Instruction • Group Work • Hands-on Work • Demonstrations • Internet Research • Cooperative Learning • Brainstorming • Class Discussions • Note Taking • Independent Design and Development • Video	• Activity Packets • Worksheets • Calculators • Hand Tools • Production Machines • Measuring Devices • Computer • AutoCAD • CAM Software • CNC Equipment	• Teacher Observation • Tests • Quizzes • Problem Solving • In-Class Work • Write-ups • Portfolio Check • Projects • Critical Thinking • Essays • Rubric • Peer Evaluation • Q/A	• Extended Time • Tutoring • Technology • Adapted Lessons • Access to Learning Support • Review and Re-teach • Peer Interaction • Group Instruction	• Additional Projects • More In-depth Projects • Technology Competition • Peer Instruction • Independent Research Projects • Field Trips

CURRICULUM

Automation

Thomas Jefferson High School

Curriculum Strand: Robotics Technology

PA Academic Standards Student must be able to do	**Objective** Content or process student will be able to know and do	**Instructional Methods**	**Materials/ Resources** Textbooks, workbooks, software, hardware, etc	***Assessment Procedures** *Additional adaptations, modification, accommodations, and enrichment/ acceleration will be provided per IEP	***Additional Learning** Opportunities for students who do not meet basic standards *Additional adaptations, modifications, and accommodations will be provided per IEP	***Extended Learning** Opportunities for students who can go beyond the basic standards. *Additional enrichment/ acceleration will be provided per IEP
3.8.10 A Analyze the relationship between societal demands and scientific and technological enterprises. 3.8.10 B Analyze how human ingenuity and technological resources satisfy specific human needs and improve the quality of life. 3.8.10 C Evaluate possibilities consequences and impacts of scientific and technological solutions.	• Evaluate and assess the effectiveness of the completed robotic device • Defend the results of the robotic device to the class	• Direct Instruction • Group Work • Hands-on Work • Demonstrations • Internet Research • Cooperative Learning • Brainstorming • Class Discussions • Note Taking • Independent Design and Development • Video	• Activity Packets • Worksheets • Calculators • Hand Tools • Production Machines • Measuring Devices • Computer • AutoCAD • CAM Software • CNC Equipment	• Teacher Observation • Tests • Quizzes • Problem Solving • In-Class Work • Write-ups • Portfolio Check • Projects • Critical Thinking • Essays • Rubric • Peer Evaluation • Q/A	• Extended Time • Tutoring • Technology • Adapted Lessons • Access to Learning Support • Review and Re-teach • Peer Interaction • Group Instruction	• Additional Projects • More In-depth Projects • Technology Competition • Peer Instruction • Independent Research Projects • Field Trips