

Newport News Public Schools  
GAITE Career Pathway Model for Mechanical Engineering Technology



**Career Cluster:** Science, Technology, Engineering and Mathematics  
**Career Pathway:** Engineering and Technology  
**Technical Studies:** Mechanical Engineering Technology  
**Related Industry Certifications Available:** AutoCAD, IC3, NOCTI  
**Transferable Credits:** up to 36 credits



	Grade	English	Math	Science	S.S.	Required Courses or Recommended Electives and/or CTE Courses		
Middle School	7	Language Arts 7	Math 7 or higher	Life Science	US History: 1877 to Present	Inventions and Innovations (8461)	Foreign Language	
	8	Language Arts 8	Math 8 Or Algebra I 3130	Physical Science	Civics & Economics	Technological Systems (8462)	Foreign Language	

**Career Assessment:** Administration of a career assessment instrument is appropriate at the middle school level to help students and their parents plan for high school (Virginia's Career Planning System or other assessment product).

*\*DE- Dual Enrollment courses must have a dual enrollment approved teacher to receive credit from Thomas Nelson Community College.*

	Grade	English	Math	Science	S.S.	Required Courses or Recommended Electives and/or CTE Courses			Related Careers
SECONDARY Career Coaching,	9	English 9 1130	Algebra I 3130 Or Geometry 3143 Or Algebra II 3135	Earth Science 4210	Geography 2210	Health & PE and Foreign Language (if necessary)	Basic Technical Drawing & Design (8435) Or Information Technology Fundamentals (6670)	<i>(Future Course *Introduction to Eng. Design PLTW 8436)</i>	<ul style="list-style-type: none"> <li>• Automated Manufacturing Technician</li> <li>• Calibration Technician</li> <li>• Manager, Supervisor</li> <li>• Quality Control Technician</li> <li>• Quality Engineer</li> <li>• Precision Inspector</li> <li>• Production Manager</li> <li>• Mechanical Engineering Technician</li> </ul>

<p><b>10</b></p>	<p>English 10 1140</p>	<p>Geometry 3143 Or Algebra II 3135 Or H Alg II/Trig 31371</p>	<p>Biology I 4310 Or <b>AP Biology</b></p>	<p>World History 2340 Or <b>AP World History</b> Or Geography 2221</p>	<p>Health &amp; PE and Foreign Language (if necessary)</p>	<p>Intro Engineering Design (8490) Or Basic Technical Drawing &amp; Design (8435)</p>	<p><i>(Future Course *Principles of Engineering PLTW (8490)</i></p>	<ul style="list-style-type: none"> <li>• Industrial Engineer Technician</li> <li>• Engineering Assistant</li> <li>• Project Manager</li> <li>• Drafter</li> <li>• Mechanical Engineer</li> </ul>
<p><b>11</b></p>	<p>English 11 1150 <b>AP</b></p>	<p>Geometry 3143 Or Algebra II 3135 Or Trigonometry/ Elementary functions 3150/3154 Or H Math Analysis 3162</p>	<p>Chemistry 4410 Or <b>AP Chemistry</b></p>	<p>US/VA History 2360 Or <b>AP US History</b></p>	<p>Foreign Lang (if necessary)</p>	<p>Intro Engineering Design (8490) Or Adv Engineering Drawing (8436) <b>(DRF 151) DE</b> Or Machine Technology – NHREC (0560) Or Material and Processes of Industry <b>(MEC 113) DE DL</b></p>	<p><i>(Future Course Computer Integrated Manufacturing PLTW 8425)</i></p>	
<p><b>12</b></p>	<p>*English 12 1160 <b>AP</b></p>	<p>Trigonometry/ Elementary Functions 3150/3154 Or Math analysis 3162 Or *Calculus 31601 Or <b>AP Calculus</b></p>	<p>Physics 45101 Or <b>AP Physics</b> Or <b>AP Chemistry</b> Or Other Science</p>	<p>US/VA Gov 2440 Or <b>AP Government</b></p>	<p><b>AP Foreign Language (optional)</b></p>	<p>Adv Engineering Drawing (8436) <b>(DRF 151) DE</b> or Computerized Numerical Controls(CNC) – NHREC (0570) <b>(MAC 121,122)</b> Or Material and Processes of Industry <b>(MEC 113) DE DL</b> Or Polymers and Composites <b>(MEC 220) DE DL</b></p>	<p><i>(Future Course Engineering Design &amp; Dev. PLTW 8491)</i></p>	

**Postsecondary Placement Assessments (Reading, Writing, & Math)**

<b>POSTSECONDARY Community College Career Placement</b>	<b>Year 1 1<sup>st</sup> Semester</b>	College Composition I (ENG 111) <b>(If not taken as dual enrollment)</b>	Pre-Calculus I (MTH 163) <b>(If not taken as dual enrollment)</b>	College Success Skills (SDV 100)	Engineering Drawing Fundamentals <b>(DRF 151)</b> <b>(If not taken as dual enrollment)</b>	Materials and Processes of Industry (MEC 113) <b>(If not taken as dual enrollment)</b>	Intro to Eng. Tech (MEC 100) <b>(If not taken as dual enrollment)</b>		
	<b>Year 1 2<sup>nd</sup> Semester</b>	Principles of Economics I (ECO 201)	Social Science Elective	College Composition II (ENG 112) <b>(If not taken as dual enrollment)</b>	Health or PE Elective (HLT/PED)	Pre-Calculus II (MTH 164) <b>(If not taken as dual enrollment)</b>	Mechanics I-Statics for Engineering Tech (MEC 131) <b>(If not taken as dual enrollment)</b>		
	<b>Year 2 1<sup>st</sup> Semester</b>	Adv. Tech. Drafting I Or Parametric Solid Modeling (DRF 211 or 241) <b>(If not taken as dual enrollment)</b>	Mechanics II-Strength of Materials for Eng. Tech. (MEC 132) <b>(If not taken as dual enrollment)</b>	College Physics PHY 201	Calculus I (MTH 173) <b>(If not taken as dual enrollment)</b>	Electronic Circuits and Instrumentation (MEC 103)	Elective chosen from MEC, DRF, or IND 145		
	<b>Year 2 2<sup>nd</sup> Semester</b>	Humanities Elective	College Chemistry (CHM 111)	Mechanics III—Dynamics for Eng. Tech (MEC 133)	College Physics (PHY 202)	Basic Fluids Mechanic-Hydraulics/Pneumatics (MEC 161) Or Polymers and Composites (MEC 220)			
<b>4-year Institution</b>	University/College: Old Dominion University					<b>Future DL classes to be offered</b>			
	Degree or Major: Mechanical Eng. Tech.					*Dual Credit course (HS to CC)			
						DL Distance Learning			
						AP Advanced Placement			



## CAREER PATHWAY SUPPLEMENTAL INFORMATION

<b>TOPIC: Career-Technical Student Organization Related Activities</b>	<b>TOPIC: Work-Based Learning (Cooperative Education, Mentoring, Internships, Job Shadowing, and Service Learning)</b>
<p>Skills USA Related Activities:</p> <ul style="list-style-type: none"> <li>3-D Visualization and Animation</li> <li>Architectural Drafting</li> <li>Automated Manufacturing Technology</li> <li>CNC Milling Technology</li> <li>CNC Turning Technology</li> <li>Customer Service</li> <li>Electronics Applications</li> <li>Electronics Technology</li> <li>Entrepreneurship</li> <li>Mechatronics</li> <li>Occupational Health and Safety</li> <li>Power Equipment Technology</li> <li>Precision Machining Technology</li> <li>Principles of Technology</li> <li>Related Technical Math</li> <li>Robotics and Automation Technology</li> <li>Sheet Metal</li> <li>TeamWorks</li> <li>Technical Drafting</li> <li>Total Quality Management</li> <li>Welding</li> </ul>	<p><b><u>COOPERATIVE EDUCATION</u></b>            Cooperative education is a method of instruction that combines career and technical classroom instruction with directly related paid employment. <i>The Career and Technical Education Cooperative Education Handbook</i> provides detailed information concerning development, regulations, teacher qualifications, and operation and management. Co-op is available through the following related courses in this pathway: Accounting; Advanced Computer Information Systems; Computer Information Systems; Design, Multimedia, and Web Technologies; and Digital Input Technologies.</p> <p><b><u>JOB SHADOWING</u></b>            Job shadowing is a short-term, career-exploration form of worksite experience in which the student “shadows” (follows) a competent worker for a brief period of time. Job shadowing usually is the first form of worksite assignment given to students and is less intensive than mentoring, internship, and service learning</p> <p><b><u>MENTORING</u></b>            Mentoring is a relationship between an experienced person (the mentor) and a less experienced person, such as a student (the mentee), in which the mentor provides guidance, support, feedback and skill instruction to the mentee. School-coordinated mentoring is more complex than job shadowing but tends to be less demanding and possibly shorter in duration than an internship or service learning.</p> <p><b><u>INTERNSHIP</u></b>            An internship is a planned, progressive, structured educational activity or program that enables students to practice and develop career-related skills in a real workplace environment. An internship is more complex than job shadowing and mentoring when they are offered as separate programs.</p> <p><b><u>SERVICE LEARNING</u></b>            Service learning is a community-based form of the work-based learning experience in which students and teachers cooperate with their locality to address problems and issues by applying knowledge and skills from several courses or from a total program.</p>