



GOVERNOR'S ACADEMY  
Innovation, Technology and Engineering



**Career Cluster:** Science, Technology, Engineering and Mathematics

**Career Pathway:** Engineering and Technology

**Technical Studies:** Mechanical Engineering Technology

**Related Industry Certifications Available:** NOCTI/CAD

|               | Grade | English   | Math                           | Science          | S.S.             | Required Courses or Recommended Electives and/or CTE Courses |                 |  |
|---------------|-------|-----------|--------------------------------|------------------|------------------|--|-----------------|--|
| Middle School | 7     | English 7 | Math 7                         | Science 7        | Social Studies 7 | Inventions and Innovations (8461)                            | World Languages |  |
|               | 8     | English 8 | Math 8<br>Or<br>Algebra I 3130 | Physical Science | Civics           | Technological Systems (8462)                                 | World Languages |  |

**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).

|                                     | Grade | English   | Math  | Science  | S.S.   | Required Courses or Recommended Electives and/or CTE Courses | Related Careers  |   |   |
|-------------------------------------|-------|---|---|--|--|--|--|---|---|
| SECONDARY<br><i>Career Coaching</i> | 9     | English 9 1130<br>Or<br>Intensified Honors English 9 1138 | Algebra I 3130<br>Or<br>Geometry 3143<br>Or<br>Algebra II 3135  | Earth Science 4211<br>Or<br><b>Advanced Earth Science 4213</b> | World History I 2341 or<br>World History II 2342         | Health & PE and<br>For. Language (if necessary)              | IT Fundamentals 6670<br>Or<br>Advance Drawing & Design 8438<br><b>(DRF 151) DE</b>   | Introduction to Eng. Design PLTW 8439<br><b>(MEC 100, DRF 151) DE</b> | <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> |
|                                     | 10    | English 10 1140<br>Or<br>Intensified English 10 1148      | Geometry 3143<br>Or<br>Algebra II 3135<br>Or<br>Trig 3166<br>Or<br>Alg II/Trig 3136<br>Or<br>PreCalculus 3161 | Biology I 4311<br>Or<br><b>Advanced Biology 4313</b>           | Geography 2221<br>Or<br><b>A.P. Human Geography 2212</b> | Health & PE and<br>For. Language (if necessary)              | IT Fundamentals 6670<br>Or<br>Advance Drawing & Design 8438<br><b>(DRF 151) DE</b><br>Or<br>Intro Engineering Design 8490<br><b>(MEC 100) DE</b> | Principles of Engineering PLTW 8441<br><b>(MEC 100) DE</b>            | <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>Honors English 11 2000<br/>Or<br/>Advanced American Studies 1183<br/>Or<br/>American Studies 1185</p>  | <p>Algebra II 3135<br/>Or<br/>Trigonometry 3166<br/>Or<br/>Alg II/Trig 3136<br/>Or<br/>PreCalculus 3161<br/>Or<br/>Calculus 3175<br/>Or<br/><b>AP Calculus 3177</b></p> | <p>Chemistry 4410<br/>Or<br/>Physics 45101</p>  | <p><b>AP History 2000</b><br/>Or<br/>Advanced American Studies 1183<br/>Or<br/>American Studies 1185</p> | <p>For. Lang (if necessary)</p> | <p>Intro Engineering Design 8490<br/><b>(MEC 100) DE</b><br/>Or<br/>Advanced Engineering 8491</p>                      | <p>Computer Integrated Manufacturing PLTW 8442</p> |  |
| <p><b>12</b></p> | <p>English 12 1161<br/>Or<br/>ADV World Lit 1190<br/>Or<br/><b>AP Lit &amp; Comp 1195</b><br/>Or<br/><b>AP Lang &amp; Comp 1213</b><br/>Or<br/><b>(Eng 111/112)</b></p> | <p>Algebra 3135<br/>Or<br/>Trigonometry 3166/<br/>Or<br/>Alg II/Trig 3136<br/>Or<br/>PreCalculus 3161<br/>Or<br/>Calculus 3175<br/>Or<br/><b>AP Calculus 3177</b></p>   | <p>Physics 45101<br/>Or<br/><b>AP Physics B 4413</b><br/>Or<br/>Other Science<br/>Or<br/><b>AP Chemistry 4411</b></p> | <p>US/VA Gov 2440<br/>Or<br/><b>AP Government 2445</b></p>   |                                 | <p>Advanced Engineering 8491<br/>Or<br/>Computerized Numerical Controls(CNC) – NHREC (0570) – <b>(MAC 121,122)</b></p> | <p>Engineering Design &amp; Dev. PLTW 8443</p>     |  |

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

|   |   |  |  |   |  |  |   |  |  |
|---|---|--|--|---|--|--|---|--|--|
| <b>POSTSECONDARY<br/>Community College<br/>Career Placement</b> | <b>Year 1<br/>1<sup>st</sup><br/>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<br/>2<sup>nd</sup><br/>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<br/>1<sup>st</sup><br/>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<br/>2<sup>nd</sup><br/>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<br/>Institution</b>                                   | University/College: Old Dominion University   |  |  |   |  |  |   |  |  |
|   | Degree or Major: Mechanical Eng. Tech.        |  |  |   |  |  |   |  |  |
|   | Number of Articulated CC Credits:             |  |  |   |  |  |   |  |  |
|   |   |  |  |   |  | <b>*Dual Credit course (HS to CC)</b>  |   |  |  |



## CAREER PATHWAY SUPPLEMENTAL INFORMATION

| <b>TOPIC: Career-Technical Student Organization<br/>Related Activities</b>   | <b>TOPIC: Work-Based Learning (Cooperative Education, Mentoring,<br/>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><br/>           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><br/>           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><br/>           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><br/>           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><br/>           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> |

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