

| Advanced Technology for Design and Production # | |
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| Course Code | 6222 |
| Recommended Maximum Enrollment | 24 |
| Grade Level | 9-10 |
| Credits | 1 |
| Prerequisite | none |
| <p>This course will engage students in the use of modern technologies in the design and improvement of products. Students will use three-dimensional CAD software in the creation and analysis process. Students will document designs using standards set by industry for design documentation. Students will implement methods of green production and just-in-time component supply which allow for the lowest cost and highest quality products. Students will design and troubleshoot data acquisition, programmable logic control, process monitoring, automation and robotic systems. Students will incorporate sensing and vision systems, utilizing cameras and sensors to control automated systems.</p> | |
| Design for the Production of Advanced Products # | |
| Course Code | 6225 |
| Recommended Maximum Enrollment | 24 |
| Grade Level | 11-12 |
| Credits | 1 |
| Prerequisite | Mechatronic Systems for Advanced Production # 6224 |
| <p>Students will create plant designs to process and automatically assemble materials into new products. Students follow the process of developing and producing a new product from prototype to final product. They will accomplish this by creating a production flow plan that allows for the mass production of the product. Students will analyze and evaluate all aspects of the design and production processes with an emphasis on clean, lean and green production. Students will utilize data acquisition, quality control processes and Six Sigma methodology to control production.</p> | |
| Mechatronic Systems for Advanced Production # | |
| Course Codes | 6224 |
| Recommended Maximum Enrollment | 24 |
| Grade Level | 10-12 |
| Credits | 1 |
| Prerequisite | Systems of Advanced Technology # 6223 |
| <p>Students will design cost-effective work cells incorporating automation and robotics to improve quality of final products. The advanced production in this course depends on the use and coordination of information, automation, network systems, vision and sensing systems. Students will design and create mechatronic systems and automated tooling to accomplish these advanced tasks. Students produce authentic documentation about their cyber-mechanical systems and the integration with data to control and monitor processes.</p> | |

| Systems of Advanced Technology # | |
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| Course Codes | 6223 |
| Recommended Maximum Enrollment | 24 |
| Grade Level | 10-11 |
| Credits | 1 |
| Prerequisite | Advanced Technology for Design and Production #6222 |
| <p>In this course, students will apply the technologies that are found in modern clean, production environments. Students study effective and energy efficient control of pumping, conveyors, piping, pneumatic and hydraulic control systems. Students apply total quality management to production design to assure quality. Students also focus on properties of materials and material testing, creating documentation to support designs, examining properties and justifying material selections based on properties. Students learn that old products become the new raw materials for new products.</p> | |