

## APPLIED DESIGN, SKILLS & TECHNOLOGIES – TECHNOLOGY EDUCATION

**Supplemental Fees in the Applied Skills Department support take home projects and enhancement materials.**

Technology Education aims to develop technological knowledge and skill in the following areas of technology:

- Communication (graphics, drafting, CAD - Computer Assisted Drafting)
- Control (broad principles of switching, sensing, and regulating)
- Energy and Power (electronics, robotics, alternate energy)
- Production (construction and manufacturing in metal, wood, plastics)
- Self and Society (understanding technology and society)
- Transportation systems (automotive, power technology)

Technology education has broader aims than traditional skill training. It aims to provide students with an understanding of how technology influences society and how societal values influence the course of technology. Technology education prepares the student to be a responsible citizen in a technological society and to meet career challenges required in today's changing workplace.

Technological activity involves the creative, inventive, and innovative use of knowledge, skills, tools and materials to modify the physical world, improve the quality of life, and extend human potential. Courses in the technology education department are recommended for those planning to enter post-secondary training in technology.

In courses involving personal projects (Wood, Construction, Electronics, and Technology), the student is responsible for the cost of all supplementary project materials they will take home. Costs will vary depending on the project and the course.

<b>DRAFTING 9</b>	<b>MADD-09</b>	<b>Supplemental Fee: \$10.00</b>
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Drafting 9 is an exciting course that introduces a range of traditional and "high-tech" technologies to students. The course is completely designed around making projects! Take home projects may include:

- Manual Drafting: 1 and 2 Point Drawings, Mechanical and Engineered Drawings, Blue-Prints, Site and Building Plans
- CAD (Vectorworks): 3D model housing, Mechanical/Engineered Drawings, ArtCam CNC Drawings, Personally Designed objects Tinker Cad 3D printing.

These will cover the Learning Standards of: Understanding Context, Defining, Ideating, Prototyping, Testing, Making, and Sharing.

- safety procedures and awareness
- types and properties of materials/parts, minimizing waste, demands of use by an ever-changing society
- tool and machine procedures: measuring devices and drafting tools, Manual Drafting Tables (Only Table in District), ArtCam Software, Vectorworks Software, Google Sketchup Software, TinkerCad Software, 3D printer, CNC machine
- project quality control and testing, environmental aspects, personal and social responsibilities

<b>ELECTRONICS &amp; ROBOTICS 9</b>	<b>MADER09</b>	<b>Supplemental Fee: \$40.00</b>
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Electronics & Robotics 9 is an exciting course that introduces a range of traditional and "high-tech" technologies to students. The course is completely designed around making projects! Take home projects may include:

- Major Projects include: Minty Boost (Cell Phone Charger), LED Flasher Circuits, ATtiny Programming.
- Individualized Projects include: Sumo-Bots, 3D printing of cases and projects, Amplifiers, Dice, Strobe Lights.

These will cover the Learning Standards of: Understanding Context, Defining, Ideating, Prototyping, Testing, Making, and Sharing.

- safety procedures and awareness
- types and properties of materials/parts, minimizing waste, demands of use by an ever-changing society
- tool and machine procedures: measuring devices, drill press, plastic heat bender, soldering irons, foot shears, sanders, 3D printing, Scroll Saws, fastening processes, computer programming.
- project quality control and testing, environmental aspects, personal and social responsibilities

<b>METALWORK 9</b>	<b>MADM-09</b>	<b>Supplemental Fee: \$30.00</b>
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Metalwork 9 is an exciting course that introduces a range of traditional and “high-tech” technologies to students. The course is completely designed around making projects! Take home projects may include:

- Metal Work Projects: Hammer, Screwdriver, Copper Bowl, Tool Box, Fireplace pokers, Hooks, Pens
- Art Metal Projects: Silver Rings, Lawn Ornament Figures, Sheet Metal Ornament Cutouts, Small Ornate Jewelry, and Small Secure Safe’s

These will cover the Learning Standards of: Understanding Context, Defining, Ideating, Prototyping, Testing, Making, and Sharing.

- safety procedures and awareness
- types and properties of materials/parts, minimizing waste, demands of use by an ever-changing society
- tool and machine procedures: measuring devices, metal lathe, band saw, drill press, forge, caster, oxy-acetylene welding, mig welding, tig welding, bar folders, metal benders, taps and dies, hand-held tools, grinders, presses, fasteners, adhesives, and milling machine.
- project quality control and testing, environmental aspects, personal and social responsibilities

<b>WOODWORK 9</b>	<b>MADW-09</b>	<b>Supplemental Fee: \$55.00</b>
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Woodwork 9 is an exciting course that introduces a range of traditional and “high-tech” technologies to students. The course is completely designed around making projects! Take home projects may include:

- Major Project: Self-designed, wall mounted or shelf Clock (Examples: Footballs, Round Shapes, Animal Cutouts, Flags, Countries etc.)
- Major Project: Bedside Table (could include drawers, shelves, glass top, tiled top, CNC design.)
- Side Projects including: Skateboards, Longboards, Cutting Boards, Wooden Toys (Cars, Planes, Kendamas, Fidget Spinners, Ping Pong Ball Rackets), Baseball Bats, Bowls, Pens, Logo Cutouts, CNC Signs (EX. Canucks, N.Y.P.D), Shelves, Picture Frames, Puzzles, and much more!

These will cover the Learning Standards of: Understanding Context, Defining, Ideating, Prototyping, Testing, Making, and Sharing.

- safety procedures and awareness
- types and properties of materials/parts, minimizing waste, demands of use by an ever-changing society
- tool and machine procedures: measuring devices, mitre saw, band saw, drill press, table saw, jointer, planer, mortising machine, sanders, hand-held tools, and CNC machine.
- project quality control and testing, environmental aspects, personal and social responsibilities

<b>DRAFTING 10</b>	<b>MTDRF10</b>	<b>Supplemental Fee: \$10.00</b>
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Drafting 10 is an exciting course that introduces a range of traditional and “high-tech” technologies to students. The course is an expansion of Drafting 9 and is completely designed around making projects! Take home projects may include:

- Manual Drafting: 1 and 2 Point Drawings, Mechanical and Engineered Drawings, Blue-Prints, Site and Building Plans,
- CAD (Vectorworks): 3D model housing, Mechanical/Engineered Drawings, ArtCam CNC Drawings, Personally Designed objects, Tinker Cad 3D printing.

These will cover the Learning Standards of: Understanding Context, Defining, Ideating, Prototyping, Testing, Making, and Sharing.

- safety procedures and awareness
- types and properties of materials/parts, minimizing waste, demands of use by an ever-changing society
- tool and machine procedures: measuring devices and drafting tools, Manual Drafting Tables (Only Table in District), ArtCam Software, Vectorworks Software, Google Sketchup Software, TinkerCad Software, 3D printer, CNC machine
- project quality control and testing, environmental aspects, personal and social responsibilities

<b>ELECTRONICS &amp; ROBOTICS 10</b>	<b>MTEAR10</b>	<b>Supplemental Fee: \$40.00</b>
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Electronics & Robotics 10 is open to all students and is an exciting course that introduces a range of traditional and “high-tech” technologies to students. The course is completely designed around making projects! Take home projects may include:

- Major Projects include: Minty Boost (Cell Phone Charger), LED Flasher Circuits, ATTiny Programming.
- Individualized Projects include: Sumo-Bots, 3D printing of cases and projects, Amplifiers, Dice, Strobe Lights.

These will cover the Learning Standards of: Understanding Context, Defining, Ideating, Prototyping, Testing, Making, and Sharing.

- safety procedures and awareness, measurement and diagnostic equipment, electrical theory.
- types and properties of materials/parts, minimizing waste, demands of use by an ever-changing society, ohm’s law, robot elements, block-based coding or logic based programming for robots
- tool and machine procedures: measuring devices, drill press, plastic heat bender, soldering irons, foot shears, sanders, 3D printing, Scroll Saws, fastening processes, computer programming.
- project quality control and testing, environmental aspects, personal and social responsibilities, sequence construction of circuit boards from schematics, understanding components, flow charts related to robot behavior

<b>METALWORK 10</b>	<b>MTMET10</b>	<b>Supplemental Fee: \$30.00</b>
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Metalwork 10 is open to all students and is an exciting course that introduces a range of traditional and “high-tech” technologies to students. The course is completely designed around making projects! Take home projects may include:

- Metal Work Projects include: Centre Punches, Mandrel, Aluminum Casting, Welding Projects, Self-directed projects of choice (We are open to any and all ideas)
- Art Metal Projects: Silver Rings, Lawn Ornament Figures, Sheet Metal Ornament Cutouts, Small Ornate Jewelry, and Small Secure Safe’s

These will cover the Learning Standards of: Understanding Context, Defining, Ideating, Prototyping, Testing, Making, and Sharing.

- safety procedures and awareness
- types and properties of materials/parts, minimizing waste, demands of use by an ever-changing society
- tool and machine procedures: measuring devices, metal lathe, band saw, drill press, forge, caster, oxy-acetylene welding, mig welding, tig welding, bar folders, metal benders, taps and dies, hand-held tools, grinders, presses, fasteners, adhesives, and milling machine.
- project quality control and testing, environmental aspects, personal and social responsibilities

<b>WOODWORK 10</b>	<b>MWWK-10</b>	<b>Supplemental Fee: \$55.00</b>
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Open to all students. The course is designed around making increasingly complex projects! Unlike previous years, students are now allowed to personally choose the projects they wish to pursue making. Come build and have fun! Take home projects may include:

- Major Project: Jewelry Box (Examples: CNC logo on top or inside, felt bottom, felt interior, music box, lock mechanisms, mirrors, variety of shapes and sizes)
- Projects of Choice may include: Skateboards, Longboards, Boogie Boards, Adirondack Chairs, Chess Board and Pieces, Crib Board, Cutting Boards, Wooden Toys (Cars, Planes, Reindeer, Fidget Spinners, Ping-Pong Ball Rackets), Baseball Bats, Bowls, Pens, Logo Cutouts, CNC Signs (EX. Canucks, N.Y.P.D), Shelves, Picture Frames, Puzzles, and much more!

These will cover the Learning Standards of: Understanding Context, Defining, Ideating, Prototyping, Testing, Making, and Sharing.

- safety procedures and awareness
- types and properties of materials/parts, minimizing waste, demands of use by an ever-changing society
- tool and machine procedures: measuring devices, mitre saw, band saw, drill press, table saw, jointer, planer, mortising machine, sanders, hand-held tools, and CNC machine.
- project quality control and testing, environmental aspects, personal and social responsibilities

<b>AUTOMOTIVE TECHNOLOGY 11</b>	<b>MTAUT11</b>	<b>Supplemental Fee: \$10.00</b>
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Automotive 11 is open to all students and is an exciting course that introduces a range of traditional and “high-tech” technologies to students. The course is designed around car care and repair!

- Automotive 11 projects and theory are centered around safe use and operation of vehicles, manuals and diagnostics, tools and equipment, lifting equipment, fundamentals of engine operation, and technological changes in the automotive industry.
- Shop work and practical labs may include: tire repair, battery system, brakes, drivetrain, exhaust, suspension, oil changes, lights and electrical, and tune-up.
- Student cars and shop cars are used for projects, as well as customer cars for variety.

These will cover the Learning Standards of: Understanding Context, Defining, Ideating, Prototyping, Testing, Making, and Sharing.

- safety procedures and awareness around vehicles, safety training on hoists, floor jacks and air tools.
- types and properties of materials/parts, minimizing waste and recycling programs, demands of use by an ever-changing society
- tool and machine procedures: measuring devices, metal/brake lathe, drill press, mig welding, taps and dies, hand-held tools, grinders, presses, fasteners, adhesives, and cleaning materials.
- project quality control and testing, environmental aspects, personal and social responsibilities.

<b>AUTOMOTIVE TECHNOLOGY 12</b>	<b>MTAUT12</b>	<b>Supplemental Fee: \$10.00</b>
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Automotive 12 is open to all students and is an exciting course that introduces a range of traditional and “high-tech” technologies to students. The course is designed around car care and repair and expands on the knowledge of automotive 11.

- Automotive 12 projects and theory are centered around vehicle inspection, advanced tools and equipment, engine and vehicle modifications, diagnostic methods, transmission functions, electrical and mechanical control systems, fuel systems and service and repair schedules.
- Shop work and practical labs may include: drive shafts, clutches, engine removal, cylinder head work, fuel system repair, diagnostics and personal projects.
- Student cars and shop cars are used for projects, as well as customer cars for variety.

These will cover the Learning Standards of: Understanding Context, Defining, Ideating, Prototyping, Testing, Making, and Sharing.

- safety procedures and awareness around vehicles, safety training on hoists, floor jacks and air tools.
- types and properties of materials/parts, minimizing waste and recycling programs, demands of use by an ever-changing society
- tool and machine procedures: measuring devices, metal/brake lathe, drill press, mig welding, taps and dies, hand-held tools, grinders, presses, fasteners, adhesives, and cleaning materials.
- project quality control and testing, environmental aspects, personal and social responsibilities.

<b>ENGINE &amp; DRIVETRAIN 12 (AUTOMOTIVE)</b>	<b>MTEAD12</b>	<b>Supplemental Fee: \$10.00</b>
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Automotive 12 Engine and Drivetrain is open to all students and is an exciting course that introduces a range of traditional and “high-tech” technologies to students. The course is designed around car care and repair and expands on the knowledge of automotive 11 and 12.

- Automotive 12 projects and theory are centered around engine design, ignition timing, performance changes, braking systems, suspension systems, engine problems and repair, and alternative fuel vehicles.
- Shop work and practical labs may include: engine removal and rebuilding, cylinder head work, fuel system repair, brake system replacement, enhancement of OEM parts.
- Student cars and shop cars are used for projects, as well as customer cars for variety.

These will cover the Learning Standards of: Understanding Context, Defining, Ideating, Prototyping, Testing, Making, and Sharing.

- safety procedures and awareness around vehicles, safety training on hoists, floor jacks and air tools.
- types and properties of materials/parts, minimizing waste and recycling programs, demands of use by an ever-changing society
- tool and machine procedures: measuring devices, metal/brake lathe, drill press, mig welding, taps and dies, hand-held tools, grinders, presses, fasteners, adhesives, and cleaning materials.
- project quality control and testing, environmental aspects, personal and social responsibilities.

<b>WOODWORK 11</b>	<b>MWWK-11</b>	<b>Supplemental Fee: \$55.00</b>
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Woodwork 11 is open to all students! It is completely designed around making one or two major projects or a large number of small projects depending on the skill set of each student. Students are expected to bring their own ideas as well as manage all aspects of the project including cost analysis, materials selection, production planning, timelines and technical drawings. Come build and have fun! Take home projects may include:

- Major Project Ideas: Guitars (Bass, Electric, Acoustic), Chairs, Shelving, Grandfather Clocks, Benches, Swinging Porch Chairs, Dining Room Tables, Living Room Tables, Small Boats, Cabinetry etc.
- Side Projects including: Skateboards, Longboards, Boogie Boards, Cutting Boards, Wooden Toys (Cars, Planes, Reindeer, Chess Boards and Pieces, Fidget Spinners, Ping Pong Ball Rackets), Baseball Bats, Bowls, Pens, Logo Cutouts, CNC Signs (EX. Canucks, N.Y.P.D), Shelves, Picture Frames, Puzzles, and much more!

These will cover the Learning Standards of: Understanding Context, Defining, Ideating, Prototyping, Testing, Making, and Sharing.

- safety procedures and awareness. Designing with inspiration from a variety of sources.
- types and properties of materials/parts, minimizing waste, demands of use by an ever-changing society
- tool and machine procedures: measuring devices, mitre saw, band saw, drill press, table saw, jointer, planer, mortising machine, sanders, hand-held tools, and CNC machine. Sharpening procedures.
- project quality control and testing, environmental aspects, personal and social responsibilities, Critical evaluation of design process and the finished projects.

<b>DRAFTING 11</b>	<b>MTDRF11</b>	<b>Supplemental Fee: \$10.00</b>
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Drafting 11 is open to all students and is an exciting course that introduces a range of traditional and “high-tech” technologies to students. The course is an expansion of Drafting 10 and is completely designed around making projects! Take home projects may include:

- Manual Drafting: 1 and 2 Point Drawings, Mechanical and Engineered Drawings, Blue-Prints, Site and Building Plans, Model development, Scale proportion when building 3D models
- CAD (Vectorworks): 3D model housing, Mechanical/Engineered Drawings, ArtCam CNC Drawings, Personally Designed objects Tinker Cad 3D printing.

These will cover the Learning Standards of: Understanding Context, Defining, Ideating, Prototyping, Testing, Making, and Sharing.

- safety procedures and awareness
- types and properties of materials/parts, minimizing waste, demands of use by an ever-changing society
- tool and machine procedures: measuring devices and drafting tools, Manual Drafting Tables (Only Table in District), ArtCam Software, Vectorworks Software, Google Sketchup Software, TinkerCad Software, 3D printer, CNC machine
- project quality control and testing, environmental aspects, personal and social responsibilities

<b>ELECTRONICS 11</b>	<b>MTELE11</b>	<b>Supplemental Fee: \$40.00</b>
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Electronics 11 is open to all students and is an exciting course that introduces a range of traditional and “high-tech” technologies to students. The course is completely designed around making projects. Take home projects may include:

- Major Projects include: ATTiny Programming, Arduino and Raspberry Pi Platforms, Electronic Sensors and Devices
- Introductory Lab Based Project: Blue-Tooth Robot, Coding, self-directed major projects!
- 3D Printed Project Designs, Rendering, and prototyping.

These will cover the Learning Standards of: Understanding Context, Defining, Ideating, Prototyping, Testing, Making, and Sharing.

- safety procedures and awareness, measurement and diagnostic equipment, electrical theory.
- types and properties of materials/parts, minimizing waste, demands of use by an ever-changing society, ohm’s law, Watt’s Law, Robot programming.
- tool and machine procedures: measuring devices, drill press, plastic heat bender, soldering irons, foot shears, sanders, 3D printing, Scroll Saws, fastening processes, computer programming.
- project quality control and testing, environmental aspects, personal and social responsibilities, sequence construction of circuit boards from schematics, understanding components.

<b>METALWORK 11</b>	<b>MTMET11</b>	<b>Supplemental Fee: \$30.00</b>
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Metalwork 11 is open to all students and is an exciting course that introduces a range of traditional and “high-tech” technologies to students. The course is completely designed around making projects. Take home projects may include:

- Metal Work 11 Projects are mainly self -directed. They may include a starter project of the following and then personal choice projects following that. Bring your own designs and ideas: Centre Punches, Mandrel, Various Tools, Aluminum Casting, Welding Projects. Small air engine projects.
- Art Metal Projects: Silver Rings, Lawn Ornament Figures, Sheet Metal Ornament Cutouts, Small Ornate Jewelry, and Small Secure Safe’s, ear rings, stained glass.

These will cover the Learning Standards of: Understanding Context, Defining, Ideating, Prototyping, Testing, Making, and Sharing.

- safety procedures and awareness, ferrous vs. non-ferrous metals, heat treatment, machine tolerances.
- types and properties of materials/parts, minimizing waste, demands of use by an ever-changing society
- tool and machine procedures: measuring devices, metal lathe, band saw, drill press, forge, caster, oxy-acetylene welding, mig welding, tig welding, bar folders, metal benders, taps and dies, hand-held tools, grinders, presses, fasteners, adhesives, and milling machine.
- project quality control and testing, environmental aspects, personal and social responsibilities

<b>METALWORK 12</b>	<b>MTMET12</b>	<b>Supplemental Fee: \$30.00</b>
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Metalwork 12 is open to all students and is an exciting course that introduces a range of traditional and “high-tech” technologies to students. The course is completely designed around making projects! Take home projects may include:

- Metal Work 12 Projects are mainly self -directed. They may include a starter project of the following and then personal choice projects following that. Bring your own designs and ideas: Centre Punches, Mandrel, Various Tools, Aluminum Casting, Welding Projects. Small air engine projects.
- Art Metal Projects: Silver Rings, Lawn Ornament Figures, Sheet Metal Ornament Cutouts, Small Ornate Jewelry, and Small Secure Safe’s, ear rings, stained glass.

These will cover the Learning Standards of: Understanding Context, Defining, Ideating, Prototyping, Testing, Making, and Sharing.

- safety procedures and awareness, ferrous vs. non-ferrous metals, heat treatment, machine tolerances, areas of metal specialization, incorporation of non-metal-related material in metalwork products
- types and properties of materials/parts, minimizing waste, demands of use by an ever-changing society
- tool and machine procedures: measuring devices, metal lathe, band saw, drill press, forge, caster, oxy-acetylene welding, mig welding, tig welding, bar folders, metal benders, taps and dies, hand-held tools, grinders, presses, fasteners, adhesives, and milling machine.
- project quality control and testing, environmental aspects, personal and social responsibilities

<b>WOODWORK 12</b>	<b>MWWK-12</b>	<b>Supplemental Fee: \$55.00</b>
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Woodwork 12 is open to all students! It is an advancement of the Woodwork 11 course. It is completely designed around making one or two major projects or a large number of small projects depending on the skill set of each student. Students are expected to bring their own ideas as well as manage all aspects of the project including cost analysis, materials selection, production planning, timelines and technical drawings. Come build and have fun! Take home projects may include:

- Major Project Ideas: Guitars (Bass, Electric, Acoustic), Chairs, Shelving, Grandfather Clocks, Benches, Swinging Porch Chairs, Dining Room Tables, Living Room Tables, Boats, Cabinetry etc.
- Side Projects including: Skateboards, Longboards, Boogie Boards, Cutting Boards, Wooden Toys (Cars, Planes, Reindeer, Chess Boards and Pieces, Fidget Spinners, Ping Pong Ball Rackets), Baseball Bats, Bowls, Pens, Logo Cutouts, CNC Signs (EX. Canucks, N.Y.P.D), Shelves, Picture Frames, Puzzles, and much more!

These will cover the Learning Standards of: Understanding Context, Defining, Ideating, Prototyping, Testing, Making, and Sharing.

- Safety procedures and awareness. Designing with inspiration from a variety of sources.
- types and properties of materials/parts, minimizing waste, demands of use by an ever-changing society
- Tool and machine procedures: measuring devices, mitre saw, band saw, drill press, table saw, jointer, planer, mortising machine, sanders, hand-held tools, and CNC machine. Sharpening procedures.
- Project quality control and testing, environmental aspects, personal and social responsibilities, Critical evaluation of design process and the finished projects. Machine Maintenance, blade changing, and major finishing processes.

<b>FURNITURE &amp; CABINETRY 12</b>	<b>MTFAC12</b>	<b>Supplemental Fee: \$55.00</b>
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This is course suited to students who have taken all the existing woodwork courses and wish to continue honing their skills and building new and innovative furniture projects. Students will be working on individualized projects and will allow an experienced woodworker an opportunity to further develop their skills.

<b>DRAFTING 12</b>	<b>MTDRF12</b>	<b>Supplemental Fee: \$10.00</b>
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Drafting 12 is open to all students and is an exciting course that introduces a range of traditional and “high-tech” technologies to students. The course is an expansion of Drafting 11 and is completely designed around making project! Take home projects may include:

- Manual Drafting: 1 and 2 Point Drawings, Mechanical and Engineered Drawings, Blue-Prints, Site and Building Plans, Detailed Drawings, Working Drawings, Assembly Drawings and
- CAD (Vectorworks): 3D model housing, Mechanical/Engineered Drawings, ArtCam CNC Drawings, Personally Designed objects Tinker Cad 3D printing.

These will cover the Learning Standards of: Understanding Context, Defining, Ideating, Prototyping, Testing, Making, and Sharing.

- safety procedures and awareness
- types and properties of materials/parts, minimizing waste, demands of use by an ever-changing society
- tool and machine procedures: measuring devices and drafting tools, Manual Drafting Tables (Only Table in District), ArtCam Software, Vectorworks Software, Google Sketchup Software, TinkerCad Software, 3D printer, CNC machine
- project quality control and testing, environmental aspects, personal and social responsibilities

<b>ELECTRONICS 12</b>	<b>MTELE12</b>	<b>Supplemental Fee: \$40.00</b>
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Electronics 12 is open to all students and is an exciting course that introduces a range of traditional and “high-tech” technologies to students. The course is completely designed around making projects!

Take home projects may include:

- Major Projects include: ATTiny Programming, Arduino and Raspberry Pi Platforms, Circuits for Analog and Digital Systems, Motors and Generators,
- Introductory Lab Based Project: Blue-Tooth Robot, Coding, self-directed major projects!
- 3D Printed Project Designs, Rendering, and prototyping.

These will cover the Learning Standards of: Understanding Context, Defining, Ideating, Prototyping, Testing, Making, and Sharing.

- safety procedures and awareness, measurement and diagnostic equipment, electrical theory.
- types and properties of materials/parts, minimizing waste, demands of use by an ever-changing society, ohm’s law, Watt’s Law, Robot programming, Kirchoff’s law.
- tool and machine procedures: measuring devices, drill press, plastic heat bender, soldering irons, foot shears, sanders, 3D printing, Scroll Saws, fastening processes, computer programming.
- project quality control and testing, environmental aspects, personal and social responsibilities, sequence construction of circuit boards from schematics, understanding components.

<b>ROBOTICS 12</b>	<b>MTROB12</b>	<b>Supplemental Fee: \$40.00</b>
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Robotics 12 is open to all students and is an exciting course that introduces a range of traditional and “high-tech” technologies to students. The course is completely designed around making projects! Take home projects may include:

- Major Projects include: ATTiny Programming, Arduino and Raspberry Pi Platforms, Java and Python programming
- Communication Projects,
- Introductory Lab Based Project: Blue-Tooth Robot, Coding, self-directed major projects!
- 3D Printed Project Designs, Rendering, and prototyping.

These will cover the Learning Standards of: Understanding Context, Defining, Ideating, Prototyping, Testing, Making, and Sharing.

- safety procedures and awareness, measurement and diagnostic equipment, electrical theory.
- types and properties of materials/parts, minimizing waste, demands of use by an ever-changing society, ohm’s law, Watt’s Law, Robot programming, Kirchoff’s law. Robotics Technology in Industry, Research and Education!
- tool and machine procedures: measuring devices, drill press, plastic heat bender, soldering irons, foot shears, sanders, 3D printing, Scroll Saws, fastening processes, computer programming.
- project quality control and testing, environmental aspects, personal and social responsibilities, sequence construction of circuit boards from schematics, understanding components.