AGRICULTURE

Arrows denote completer sequences. Courses should be taken in sequential order. Alternate courses may be used to satisfy VDOE graduation sequence requirements. Refer to cteresource.org for updated VDOE completer sequences.

**HORTICULTURE**

8034 Horticultural Science and Practices
Grade 10 - 12

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8035 Greenhouse Plant Production and Management
Grade 11 - 12

**LANDSCAPING**

8036 Landscaping
Grade 10 - 12

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8039 Landscaping II
Grade 11 - 12

**NATURAL RESOURCES**

80400 Introduction to Natural Resources
Grade 10 - 12

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80410 Fisheries and Wildlife Management
Grade 10 - 12

**SMALL ENGINE REPAIR**

80820 Small Engine Repair I
Grade 9 - 12

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80180 Agriculture Power Systems
Grade 10 - 12
Course number change as of 2013-14 SY

Updated November 2014
### ANIMAL SCIENCE

- **80830 Small Animal Care**  
  Grade 9-12  

- **80880 Veterinary Science**  
  Grade 10 - 12

### WELDING

- **80190 Welding I**  
  *DE8019  
  Grade 11-12  
  This course can also be taught as T&I 8637

- **DE8095 Dual Enrolled Welding II**  
  Grade 11 - 12  
  Course number change as of 2013-14 SY

### COMPLETER SEQUENCE

<table>
<thead>
<tr>
<th><strong>Horticulture</strong></th>
<th><strong>Natural Resources</strong></th>
<th><strong>Small Engine Repair</strong></th>
<th><strong>Animal Science</strong></th>
</tr>
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<tbody>
<tr>
<td>8007, 8036, 8038, 8039, 8055</td>
<td>8007, 8008</td>
<td>8008, 8019</td>
<td>8008, 8080</td>
</tr>
</tbody>
</table>

The following alternate courses may be substituted for one of the courses in the completer sequence. For transfer students, other DOE courses may be available.

### ALTERNATE COURSES

- **8007 Introduction to Plant Systems**  
  Grade 9 - 10

- **8008 Agricultural Mechanics and Basic Animal Science**  
  Grade 9 - 10

- **8038 Floriculture**  
  Grade 10 - 12

- **8055 Floral Production and Design**  
  Grade 10 - 12

- **8080 Equine Management and Production**  
  Grade 9 - 12

Updated November 2014
BUSINESS AND INFORMATION TECHNOLOGY

Arrows denote completer sequences. Courses should be taken in sequential order. Alternate courses may be used to satisfy VDOE graduation sequence requirements.

Refer to cteresource.org for updated VDOE completer sequences.

ACCOUNTING

6320 Accounting
Grade 9-12

6321 Advanced Accounting
Grade 10-12

COMPUTER INFORMATION SYSTEMS

6612 Computer Information Systems
Grade 10-12

6613 Advanced Computer Information Systems
Grade 11-12

WEB DESIGN

6630 Web Design
Grade 11-12

6631 Desktop Publishing
Grade 11-12

PROGRAMMING

6640 Introduction to Interactive Programming
Grade 11-12

6641 Advanced Programming
Grade 11-12

Updated November 2014
The following alternate courses may be substituted for one of the courses in the completer sequence. For transfer students, other DOE courses may be available.

<table>
<thead>
<tr>
<th>COMPLETER SEQUENCE</th>
<th>Courses</th>
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<tbody>
<tr>
<td>Accounting</td>
<td>6115, 6135, 6612, 6613, 6625, 6630, 6631</td>
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<tr>
<td>Computer Information Systems</td>
<td>6115, 6131, 6135, 6320, 6612, 6613, 6625, 6630, 6631, 6640, 6641, 6670</td>
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<tr>
<td>Web Design</td>
<td>6115, 6131, 6135, 6320, 6321, 6612, 6613, 6625, 6640, 6641, 6670</td>
</tr>
<tr>
<td>Programming</td>
<td>6115, 6612, 6613, 6630, 6631, 6640, 6670</td>
</tr>
</tbody>
</table>

**ALTERNATE COURSES**

- **6115 Principles of Business and Marketing**  
  Grade 9-10
- **6131 Business Law**  
  Grade 11-12
- **6135 Business Management**  
  Grade 9-12
- **6640 Introduction to Interactive Programming**  
  Grade 11-12
- **6670 Information Technology (IT) Fundamentals**  
  Grade 9-10
- **6625 Word Processing**  
  Grades 9-12

**6120 Economics and Personal Finance**  
Grade 11-12

*Starting with the class of 2014-15, this course will be required for graduation and may not be used to meet any other graduation requirement.*
CABINETMAKING AND CARPENTRY

Technology Education and Trades and Industry

Arrows denote completer sequences. Courses should be taken in sequential order.
Refer to cteresource.org for updated VDOE completer sequences.

8431 Construction Technology (Tech Ed Course) Grade 9-10
8433 Materials and Processes Technology (Tech Ed Course) Grade 9-10
8425 Manufacturing Systems (Tech Ed Course) Grade 10-12

8604 Cabinet Making I (T & I Course) Grade 10-11 140 hours
8605 Cabinet Making II (T & I Course) Grade 11-12 280 hours

8601 Carpentry I (T & I Course) Grade 10-11 140 hours
8602 Carpentry II (T & I Course) Grade 11-12 280 hours

8603 Carpentry III (T & I Course) Grade 12 280 hours Optional Course

Updated November 2014
Engineering and Architecture
AHS, CHS, EMHS

Arrows denote completer sequences- two course minimum.
Courses offered as dual enrolled must be grade 11-12 only.
Refer to cteresource.org for updated VDOE completer sequences.

ENGINEERING AND ARCHITECTURE GRAPHICS

8435 Technical Drawing and Design
Grade 9-12
This course is interchangeable with
8439 Introduction to Engineering Curriculum

8436 Engineering Drawing and Design
Grade 10-12

8437 Architectural Drawing and Design
Grade 10-12
This course is interchangeable with 8430 Architecture and Civil Engineering

8438 Advanced Drawing and Design
Grade 11-12

PRE-ENGINEERING (PLTW)

8439 Introduction to Engineering Design (PLTW)
Grades 9-12

8441 Principles of Engineering (PLTW)
Grade 10-12

8442 Computer Integrated Manufacturing (PLTW)
Grade 11-12

8430 Civil Engineering and Architecture (PLTW)
Grade 11-12

Updated November 2014
**Engineering Graphics and PLTW Engineering**

BHS Only

NOTE: 8439 and 8530 cover the same curriculum and can be taught con-currently. The course number used for an individual student must match the sequence in which it will be completed, based on the student's individual career plan.

**PRE-ENGINEERING (PLTW)**
Arrows denote possible completer sequences- two course minimum. Courses are to be taken in grade level sequence.

- **8439 Intro to Engineering Design (PLTW)**
  - Grades 9-12
- **8441 Principles of Engineering (PLTW)**
  - Grade 10-12
- **8442 Computer Integrated Manufacturing (PLTW)**
  - Grade 11-12
- **8430 Civil Engineering and Architecture (PLTW)**
  - Grade 11-12

**ENGINEERING AND ARCHITECTURAL GRAPHICS**
Arrows denote possible completer sequences- two course minimum. Courses are to be taken in grade level sequence.

- **8530 Introduction to Engineering Design**
  - Grade 10-11
  - 140 hours
- **8531 Engineering Design Graphics**
  - Grades 11-12
  - 280 hours
- **8532 Civil Engineering and Architectural Design Graphics**
  - Grade 11-12
  - 280 hours
- **8438 Advanced Drawing and Design**
  - Grade 11-12
  - 140 hours

Updated November 2014
FAMILY AND CONSUMER SCIENCES

Arrows denote completer sequences. Courses should be taken in sequential order. Alternate courses may be used to satisfy VDOE graduation sequence requirements. Refer to cteresource.org for updated VDOE completer sequences.

CULINARY ARTS

8275 Culinary Arts I
Grade 10 -11
280 hours, Two Credits

8276 Culinary Arts II
Grade 11 -12
280 hours, Two Credits

EARLY CHILDHOOD EDUCATION

8285 Early Childhood Education I
Grade 10 -12
280 hours

8286 Early Childhood Education II
Grade 11 -12
280 hours
ALTERNATE COURSES

8219 Independent Living
Grade 9 - 11

8225 Family Relations
Grade 9 - 12

8223/8228 Family Relations /Nutrition and Wellness
Grade 9 - 12

8229 Nutrition and/Wellness
Grade 9 - 12

8259 Introduction to Hospitality, Tourism and Recreation
Grade 9 - 12

8295 Interior Design I
Grade 10 - 12
280 hours

8234 Introduction to Early Childhood Education
Grade 9 -12

8248 Introduction to Design
Grade 9 - 12

8250 Introduction to Culinary Arts
Grade 9 -10
140 hours, One Credit

8279 Culinary Arts Specialization (Formerly Culinary Arts III))
Grade 12
140 hours, One Credit

8255 Introduction to Interior Design
Grade 10 - 12

Updated November 2014
<table>
<thead>
<tr>
<th>COMPLETER SEQUENCE</th>
<th>The following alternate courses may be substituted for one of the courses in the completer sequence. Any two course on the same line may be a sequence. Always check ctereresource.org. Other DOE courses may be available may be available for transfer students.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Culinary Arts 8275, 8276</td>
<td>8279, 8250, 8229, 8219, 8229</td>
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<tr>
<td>Early Childhood Education 8285, 8286</td>
<td>8234, 8225, 8223/8228, 8229,</td>
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<tr>
<td>Family Relations 8225</td>
<td>8219, 8229, 8295, 8234</td>
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<tr>
<td>Independent Living 8219</td>
<td>8225, 8229, 8259, 8295, 8234, 8248, 8255</td>
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<tr>
<td>Nutrition and Wellness 8229</td>
<td>8219, 8225, 8259, 8234,</td>
</tr>
<tr>
<td>Introduction to Interior Design 8255</td>
<td>8219, 8225, 8295,</td>
</tr>
</tbody>
</table>

Updated November 2014
HEALTH AND MEDICAL SCIENCES

Arrows denote completer sequences- two course minimum.
Courses offered as dual enrolled must be grade 11-12 only.
Refer to cteresource.org for updated VDOE completer sequences.

HEALTH OCCUPATIONS

8302 Introduction to Health and Medical Sciences
Grade 10-12
140 hours

8383 Medical Terminology
Grade 11-12
140 hours

8333 Emergency Medical Technician I
Grade 11-12
280 hours

8331 Health Assisting Careers
Grade 11-12
140 hours

8332 Mental Health Assisting Careers
Grade 12
280 hours

Updated November 2014
MARKETING

Arrows denote completer sequences. Courses should be taken in sequential order. Alternate courses may be used to satisfy VDOE graduation sequence requirements. Refer to ctresource.org for updated VDOE completer sequences.

- 8120 Marketing
  Grade 10 - 12

- 8130 Advanced Marketing
  Grade 11 - 12

- 8140 Fashion Marketing
  Grade 10 - 12

- 8145 Advanced Fashion Marketing
  Grade 11 - 12

- 8175 Sports, Entertainment, and Recreation Marketing
  Grade 10 - 12

- 8177 Advanced Sports, Entertainment, and Recreation Marketing
  Grade 11 - 12

- 8135 Global Marketing and Commerce
  Grade 10 - 12

- 8136 Advanced Global Marketing and Commerce
  Grade 11 - 12

Updated November 2014
<table>
<thead>
<tr>
<th>COMPLETER SEQUENCE</th>
<th>ALTERNATE COURSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marketing</td>
<td>The following alternate courses may be substituted for one of the courses in the</td>
</tr>
<tr>
<td></td>
<td>completer sequence. For transfer students, other DOE courses may be available.</td>
</tr>
<tr>
<td></td>
<td>8125, 8135, 8136, 8140, 8145, 8175, 8177</td>
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<tr>
<td>Fashion Marketing</td>
<td>8120, 8125, 8135, 8136</td>
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<tr>
<td>Sports, Entertainment, and Recreation Marketing</td>
<td>8120, 8125, 8135, 8136</td>
</tr>
<tr>
<td>Global Marketing and Commerce</td>
<td>8120, 8125, 8130, 8140, 8145, 8175, 8177</td>
</tr>
</tbody>
</table>

**ALTERNATE COURSE**

8125 Digital Marketing
Grade 11 - 12
Robotics TECHNOLOGY EDUCATION

Arrows denote completer sequences. Courses should be taken in sequential order. Refer to cteresource.org for updated VDOE completer sequences.

ROBOTICS and MANUFACTURING

84210 Technology of Robotic Design
Grade 9-11

84250 Manufacturing Systems
Grade 9-12

FIRST ROBOTICS LEAGUE

Local Electives
NOT PART OF ANY CTE COMPLETER SEQUENCE

98281 or 84210 Robotics Experience I

98282 Robotics Experience II

98283 Robotics Experience III

Updated November 2014
**Technology Education**

Arrows denote completer sequences. Courses should be taken in sequential order. Refer to [ctereresource.org](http://ctereresource.org) for updated VDOE completer sequences.

- 84210 Technology of Robotics Design
  Grade 9-11

- 8425 Manufacturing Systems
  Grade 10-12

- 8431 Construction Technology
  Grade 9-10

- 8433 Materials and Processes Technology
  Grade 9-10

- 8425 Manufacturing Systems
  Grade 10-12

Any Two Coursed in this sequence constitute a Completer Sequence

Updated November 2014
CABINETMAKING AND CARPENTRY

Arrows denote completer sequences. Courses should be taken in sequential order. Refer to cteresource.org for updated VDOE completer sequences.

8604 Cabinet Making I
(T & I Course)
Grade 10-11
140 hours

8605 Cabinet Making II
(T & I Course)
Grade 11-12
280 hours

8601 Carpentry I
(T & I Course)
Grade 10-11
140 hours

8602 Carpentry II
(T & I Course)
Grade 11-12
280 hours

8603 Carpentry III
(T & I Course)
Grade 12
280 hours
Optional Course

Updated November 2014
**TRADE AND INDUSTRIAL**

Any two courses connected by an arrow constitute a completer sequence. Courses should be taken in sequential order. Refer to cteresource.org for updated VDOE completer sequences.

**ADVERTISING DESIGN**

8570 Advertising Design I  
Grade 10-11

8571 Advertising Design II  
Grade 11-12

**AUTOMOTIVE TECHNOLOGY**

8506 Automotive Technology I  
Grade 10-11  
140 hours

8507 Automotive Technology II  
Grade 11-12  
280 hours

8508 Automotive Technology III  
Grade 12  
280 hours

**BUILDING TRADES**

8515 Building Trades I  
Grade 10-11  
140 hours

8516 Building Trades II  
Grade 11-12  
280 hours
CABINET MAKING

8604 Cabinet Making I
Grade 10-11
140 hours

8605 Cabinet Making II
Grade 11-12
280 hours

CARPENTRY

8601 Carpentry I
Grade 10-11
140 hours

8602 Carpentry II
Grade 11-12
280 hours

8603 Carpentry III
Grade 12
280 hours

CINEMA & PHOTOGRAPHIC PRODUCTION I

8607 Cinema and Photographic Production I
Grade 9-11
140 hours

8608 Cinema and Photographic Production II
Grade 10-12
280 hours

Updated November 2014
COMPUTER SYSTEMS TECHNOLOGY

8621 Computer Repair and Servicing
Grade 9-10
140 hours
This course is a recommended introductory course and is not part of the completer sequence.

8622 Computer Systems Technology I
Grade 10-12
140 hours

8623 Computer Systems Technology II
Grade 11-12
280 hours

COSMETOLOGY

8527 Cosmetology I
Grade 10-11
280 hours

8528 Cosmetology II
Grade 11-12
280 hours

8546 Beauty Salon Assistant
140 hours
Required Course at BHS
A minimum of six credit hours are required for a completer sequence in Cosmetology
DRAFTING / PRE-ENGINEERING

8530 Introduction to Engineering Design
Grade 11-12
140 hours →

8531 Engineering Design Graphics
Grade 11-12
280 hours →

8532 Civil Engineering and Architectural Design
Grade 11-12
280 hours

ELECTRICITY

8533 Electricity I
Grade 10-11
140 hours →

8534 Electricity II
Grade 11-12
280 hours →

8535 Electricity III
Grade 12
280 hours

GRAPHIC IMAGING TECHNOLOGY

8660 Graphic Imaging Technology I
Grade 9-11
140 hours →

8661 Graphic Imaging Technology II
Grade 11-12
280 hours

8662 Graphic Imaging Technology III
Grade 12
280 hours
This course is in transition

Updated November 2014
HVAC ACADEMY

DE8504 HVACR Academy DE (CZ)
Grade 11-12

HVAC

8503 HVACR I
Grade 10-11
140 hours

8504 HVACR II
Grade 11-12
280 hours

PRECISION MACHINING TECHNOLOGY

8539 Precision Machining Technology I
Grade 10-11
140 hours

8540 Precision Machining Technology II
Grade 11-12
280 hours
The Governor's STEM Academy is designed to promote student achievement and interest in STEM fields that are related to Advanced Manufacturing. Skill sets required for high demand STEM fields include Machining, Welding, Engineering, Robotics, and Information Technology.

Students who are interested in registering for the MCPS Governor's STEM Academy may do so by choosing a course from one of the following MCPS Fields of study:

- Technical Drawing and Design
- Engineering
- Precision Machining
- Welding
- Computer Systems Technology
- Computer Information Systems
- Robotics
- Manufacturing Systems

Register for a course marked as "Governor's STEM Academy Course" in your school's course catalogue. Requirements for completing the STEM Academy and earning a Governor's STEM Academy Seal will be explained to you in your career and technical course.

You may complete the career and technical course without participating in the Academy.

MCPS Governor's STEM Academy Pathways

**STEM: Engineering and Technology (PLTW)**
- 84390 Introduction to Engineering Design, DE
- 84410 Principles of Engineering, DE
- 84420 Computer Integrated Manufacturing, DE
- 8430 ARCHITECTURE AND CIVIL ENGINEERING

**STEM Engineering and Technology (Technical Drawing and Design)**
- 85300 ENGINEERING DESIGN GRAPHICS
- 85310 CIVIL ENGINEERING AND ARCHITECTURAL DESIGN GRAPHICS
- 85320 ADVANCED ENGINEERING DESIGN GRAPHICS
- OR
- 84350 Technical Drawing and Design
84360 Engineering Drawing and Design, DE
84370 Architectural Drawing and Design
84380 Advanced Drawing and Design, DE (optional)

**STEM: Engineering and Technology**
84210 Technology of Robotics Design
84250 Manufacturing Systems

**Manufacturing: Production**
85390 Precision Machining, DE
85400 Precision Machining II, DE

OR
80190 Welding I, DE
80191 Welding II, DE

**Information Technology: Programming and Software Development (Computer Programming)**
66400 Programming
66410 Advanced Programming

**Information Technology: Information Support and Services**
66120 Computer Information Systems, DE
66130 Advanced Computer Information Systems

**Information Technology: Information Support Services**
86220 Computer Systems Technology I
86230 Computer Systems Technology II
86210 Computer Maintenance (Optional)
66700 Information Technology Fundamentals

**Information Technology: Web and Digital Communications**
66300 Design, Multimedia, and Web Technologies
66310 Advanced Design, Multimedia, and Web Technologies
**Information Technology: Network Systems**
66500 Computer Network Software Operations I
66510 Computer Network Software Operations II

**Manufacturing: Manufacturing Production Process Development**
84250 Manufacturing Systems I
84330 Materials and Processes

**Architecture and Construction: Construction**
84310 Construction Technology
84330 Materials and Processes

   86010 Carpentry I
   86020 Carpentry II
   86030 Carpentry III

   86040 Cabinetmaking I
   86050 Cabinetmaking II

**Robotics (General Elective)**
98281 Robotics I
98282 Robotics II
98283 Robotics III

**Principals of Technology /Applied Physics (Pending Board Approval)**
98110 Principals of Technology /Applied Physics I
98120 Principals of Technology / Applied Physics II