# Request for Approval with Assurances
## Montana Big Sky Pathways (Programs of Study)

The Carl D. Perkins Career and Technical Education Act of 2006 (Perkins IV) calls for states to offer "career and technical programs of study," known as Big Sky Pathways in Montana, as an option to students and their parents when planning for and completing future coursework. These programs, at a minimum, must:

- Incorporate and align secondary and postsecondary education elements,
- Include academic and CTE content in a coordinated, non-duplicative progression of courses,
- Offer the opportunity, where appropriate, for secondary students to acquire postsecondary credits, and
- Lead to an industry-recognized credential or certificate at the postsecondary level, or an associate or baccalaureate degree.

## Assurances:

*By my signature on this form, I assure that the proposed Big Sky Pathway submitted for approval by this high school/college satisfies the 10 stated requirements. For approval, all 10 requirements must be checked.*

<table>
<thead>
<tr>
<th>Name of Big Sky Pathway (cluster level):</th>
<th>Manufacturing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of High School:</td>
<td>Florence Carlton</td>
</tr>
<tr>
<td>Names of Secondary Lead Teacher and Counselor:</td>
<td>Weston Jones &amp; Stacy Holden</td>
</tr>
<tr>
<td>Lead Teacher's email address:</td>
<td><a href="mailto:Jonesw@Florence.k12.mt.us">Jonesw@Florence.k12.mt.us</a></td>
</tr>
<tr>
<td>Lead Teacher's phone number:</td>
<td><a href="mailto:holdens@florence.k12.mt.us">holdens@florence.k12.mt.us</a></td>
</tr>
<tr>
<td>Name of College:</td>
<td>UM COT</td>
</tr>
<tr>
<td>Name of College Program:</td>
<td>AAS Welding Technology</td>
</tr>
<tr>
<td>Name of College Lead Faculty Member:</td>
<td>Mark Raymond</td>
</tr>
</tbody>
</table>

### REQUIREMENTS FOR APPROVAL

1. Includes all state and local graduation requirements  
2. Identifies the appropriate secondary CTE, academic, and recommended elective courses offered by this high school which will prepare the student for college-level courses without remediation  
3. Outlines a non-duplicative sequence of courses from grades 9-12 and from secondary to postsecondary education  
4. Prepares students for entry into a postsecondary program or apprenticeship  
5. Leads to an industry-recognized postsecondary credential, degree or employment  
6. Includes appropriate state standards and/or industry skills standards. Identify standards used: NCCCR and Montana Tech. Standards  
7. Aligns with an AAS program offered by a Montana college (college of technology, community college, tribal college, MSU-Northern)  
8. Links with a web-based guidance delivery system such as MCIS If using something other than MCIS, please indicate:  
9. When applicable, dual enrollment opportunities have been identified.  
10. When applicable, Advanced Placement, IB courses and CTE START (statewide articulations) have been identified.

### High School Principal's Signature: [Signature]
Date: 2/1/11

### H.S. Advisory Committee Member’s Signature: [Signature]
Date: 2/1/11

### College Chief Academic Officer’s Signature: [Signature]
Date: 3/5/11

### College Lead Faculty Member’s Signature: [Signature]
Date: 3/5/11

Please submit this Request for Approval form and a copy of the Big Sky Pathway Proposal to:

OPI, Career and Technical Education, P.O. Box 221601, Helena, Montana 59621-6604

OPI Specialist Approval: [Signature] Date of Approval: 9-6-2011

OCHE Approval: [Signature] Date of Approval: 10-10-2011

Both the college and the high school will receive a signed copy when the BSP is approved.

January 2011
**HIGH SCHOOL: Florence-Carlton**

**COLLEGE: U of M COT**

**COLLEGE DEGREE PROGRAM:**
Jobs in the manufacturing career cluster involve planning, managing, and performing the processing of materials into intermediate or final products and related professional and technical support activities, such as production planning and control, maintenance, and manufacturing/process engineering.

**Pathway Options:**
- Production
- Manufacturing & Production Process Development
- Maintenance, Installation and Repair
- Quality Assurance
- Logistics and Inventory Control
- Health, Safety and Environmental Assurance

**Occupation Examples:**
Assembler, MIG Welder, TIG Welder, Machine Operator, Sheet Metal Worker, Mechanical Engineer, Industrial Engineer, Quality Control Technician, Safety Technician, Safety Engineer, Dispatcher, Production Manager, Purchasing Agent, Logistician

For a complete listing, go to: [http://online.onetcenter.org/find/career?c=13&q=Go](http://online.onetcenter.org/find/career?c=13&q=Go)

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**SUGGESTED HIGH SCHOOL COURSES**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Course Details</th>
<th>Recommended CTE Cluster Foundation Courses</th>
<th>Other Recommended CTE Courses</th>
<th>CTE Student Organization(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9th</td>
<td>Graduation Requirements Workforce/2-Year College Prep</td>
<td>Exploratory Tech</td>
<td>Other CTE Courses:</td>
<td>Metals I, CAD I, Woods I</td>
</tr>
<tr>
<td></td>
<td>4-Year MT College/Univ Prep (Rigorous Core)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>CTE and/or Electives</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10th</td>
<td>Graduation Requirements Workforce/2-Year College Prep</td>
<td>English 10, Geometry, Biology, World History, PE/Health</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4-Year MT College/Univ Prep (Rigorous Core)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>CTE and/or Electives</strong></td>
<td>Metals I &amp; Metals II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11th</td>
<td>Graduation Requirements Workforce/2-Year College Prep</td>
<td>English 11, Algebra II, Science, U.S. History</td>
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<tr>
<td></td>
<td>4-Year MT College/Univ Prep (Rigorous Core)</td>
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<tr>
<td></td>
<td><strong>CTE and/or Electives</strong></td>
<td>See Other Recommended CTE Courses</td>
<td></td>
<td>Metals II, CAD II, Woods II</td>
</tr>
<tr>
<td>12th</td>
<td>Graduation Requirements Workforce/2-Year College Prep</td>
<td>English 12, American Government</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>4-Year MT College/Univ Prep (Rigorous Core)</td>
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<td></td>
</tr>
<tr>
<td></td>
<td><strong>CTE and/or Electives</strong></td>
<td>See Other Recommended CTE Courses</td>
<td></td>
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</tr>
</tbody>
</table>

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**ADVANCED LEARNING OPPORTUNITIES**
High School to College/Career Linkages

**CTE START courses:**

Advanced Placement or IB courses:

Dual Enrollment courses:

Online courses:

Other:

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**POSTSECONDARY PROGRAM OF STUDY**

<table>
<thead>
<tr>
<th>13—Semester 1</th>
<th>Math</th>
<th>English</th>
<th>Major</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>M111 Technical Mathematics</td>
<td>WRIT 121 Introduction to Technical Writing</td>
<td>WLDG 150 Welding Layout Techniques</td>
<td>MPR 114T Related Metals Processes</td>
<td></td>
</tr>
<tr>
<td>WLDG 180 Shielded Metal Arc Welding</td>
<td>WLDG 205 Applied Metallurgy</td>
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</tbody>
</table>
| 13—Semester 2 | WLDG 187 Flux Core Arc Welding  
WLDG 184 Osha Rules & Regulations  
WLDG 117 Blueprint Reading & Welding  
WLDG 145 Fabrication Basics | PSYX 163 Work Attitudes |
|---------------|----------------------------------------------------------------------|--------------------------|
| 14—Semester 1 | WLDG 210 Pipe Welding-Integrated Lab  
WLDG 210 Gas Tungsten Arc Welding (Integrated Lab) | CADX 195 Intro to Computer Aided Design & Drafting  
MPR 214T Advanced Related Metals Processes |
| 14—Semester 2 | WLDG 245 Metal Fabrication Design & Construction  
WLDG 275 Gas Metal Arc Welding  
WLDG 280 Welding Certification and Codes | BUS 242T Supervision |

### MONTANA POSTSECONDARY OPPORTUNITIES

Montana University System Degree and Program Inventory: [http://www.homepage.montana.edu/~mus/drginv/](http://www.homepage.montana.edu/~mus/drginv/)  
Your Guide to Montana’s Certificate and Associate Degree Programs: [http://mus.edu/twowyear/YourGuide.html](http://mus.edu/twowyear/YourGuide.html)

**Colleges of Technology:**  
BLCOT—Billings; GFCOT—Great Falls; HCT—Helena; TECHCOT—Butte; UMCOT—Missoula; GCP—Bozeman

**Community Colleges:**  
DCC—Glendive;  
FVCC—Kalispell;  
MCC—Missoula City

**Tribal Colleges:**  
BFCC—Browning;  
CDKC—Lame Deer;  
FBCC—Helena;  
FPCC—Poplar;  
LBHC—Crow Agency;  
SCC—Box Elder;  
SKC—Pablo

**Four Year Colleges/Universities:**  
MSU—Bozeman;  
MSUB—Billings;  
MSUN—Havre;  
TECH—Butte;  
UM—Missoula;  
UMW—Dillon

### MILITARY
- Requires diploma or GED  
- 17 with parental consent; 18 without  
Air Force, Air Guard, Army, Coast Guard, Marines, and Navy  
For more information: [http://todaysmilitary.com](http://todaysmilitary.com)

### PROFESSIONAL CERTIFICATE
- Requires diploma or GED  
- Less than 30 credits; little/no general ed credits  
- Complete in one year or less  
Welding Technology — FVCC

### APPRENTICESHIP
- Requires diploma or GED  
- Must be at least 18  
- Minimum 2,000 hours of supervised experience  
Electricians  
Sheet Metal Workers  
See the MT Dept of Labor website for more information: [http://wdl.dln.mt.gov/apprenticeship/default.asp](http://wdl.dln.mt.gov/apprenticeship/default.asp)

### CERTIFICATE OF APPLIED SCIENCE
- Requires diploma or GED  
- 30-45 credits; limited general education credits  
- Complete in one year or less  
Industrial Machine Technology/CNC — FVCC  
Metals (Fabrication) Technology — BLCOT  
Machine Tool Technology — HCT, UMW  
Sustainable Energy Technician — BLCOT, TECHCOT, GFCOT, MSUN  
Water Quality Technology — HCT, MSUN  
Welding Technology — HCT, UMCOT, GFCOT, BLCOT, GCP, MSUN, MCC, FVCC, FPCC

### ASSOCIATE’S OF APPLIED SCIENCE DEGREE
- Requires diploma or GED  
- 60-72 credits; includes 15-25 general ed credits  
- Complete in two years (if prepared academically in math and English)  
Biofuel Energy — MCC  
Electronics Technology — UMCOT  
Energy Technology — UMCOT  
Metals (Fabrication) Technology — HCT, TECHCOT, BLCOT  
Machine Tool Technology — HCT  
Power Plant Technology — BLCOT  
Process Plant Technology — BLCOT  
Sustainable Energy Technician — BLCOT, TECHCOT, GFCOT, MSUN  
Water Quality Technology — FPCC
<table>
<thead>
<tr>
<th>Baccalaureate Degree</th>
<th>Welding Technology — HCOT, UMCOT, BLCOT, FVCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Requires 4-year college prep for admission</td>
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<tr>
<td>• 128 credits (approximately)</td>
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<tr>
<td>• Complete in four years</td>
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<tr>
<td>Bioengineering — MSU</td>
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<tr>
<td>Electrical Engineering — TECH, MSU</td>
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<tr>
<td>Civil Engineering — TECH, MSU</td>
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<tr>
<td>Industrial Engineering — MSU</td>
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<tr>
<td>Mechanical Engineering — TECH, MSU</td>
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<tr>
<td>Mining Engineering — TECH</td>
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<tr>
<td>Occupational Safety &amp; Health — TECH</td>
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<tr>
<td>Welding Engineering — TECH</td>
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<tr>
<td>Metallurgical &amp; Materials Engineering — TECH</td>
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<tr>
<td>Petroleum Engineering — TECH</td>
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</tbody>
</table>

*Degree and Program Inventory above may not be all inclusive*