

**Wyoming Community College Commission**  
**Request for**  
**New, Pilot or Revised Degree or Certificate**

**A. College:** Laramie County Community College

**B. Date** submitted to WCCC: \_\_\_\_\_

**C. Program**

1. Request for:

New Program     Pilot Program     Revised Program

2. **Program Title:** Welding Technology

3. Degree or Certificate to be awarded:

Degree:     AA     AS     AAS     Other

Certificate

4. Educational Pathway:

Energy     Construction     Hospitality     Technology     Health Care     other

5. Total number of credit hours: 41

5. Suggested CIP (Classification of Instructional Program) code (6-digit):

48.0508

6. Planned semester/year new program will begin: Fall 2015

8. Will any part of this program be provided by non-accredited vendor(s)?

YES (Provide details)                       NO

Will all or part of this program be available to students via online or other distance education technologies?

At the start of the program?     Within three years of the start of the program?     No

**D. Program description** as it will be included in college catalog:  
*(Type description here)*

The Welding Technology program of study leads to certificate and prepares students for work in the field of welding technology. In addition to gaining an overall understanding of welding machines, weld processes, and hands-on welding proficiency, students develop skills in the areas of print reading, welding symbols, weld inspection, destructive and non-destructive testing, computer-aided drafting along with precision machine tool operation. Students gain knowledge and skills necessary to prepare them for weld qualification to code specification(s).

1. Expected Student learning outcomes from completion of the program: Students will be able to:

Identify weld joint designs, identify the advantages and the limitations of the welding process, explain filler metal classifications and number systems, demonstrate proper bead placement, evaluate completed welds for compliance with industry standards, prepare material for destructive tests following American Welding Society standards for testing and identify acceptable and unacceptable fillet weld profiles.

2. Program Layout by Semester

WELD 1555	Welding Technology Safety	2
WELD 1650	Print Reading and Welding Symbols	3
WELD 1655	Allied Cutting Processes	2
WELD 1755	Shielded Metal Arc Welding I	4
WELD 1756	Shielded Metal Arc Welding II	4
WELD 1771	Gas Metal Arc Welding/Flux Core Arc Welding	4
WELD 2650	Gas Tungsten Arc Welding	4
Semester hours total:		23
WELD 2680	Welding Metallurgy	2
WELD 1760	Advanced Shielded Metal Arc Welding	4
WELD 1805	Pipe Welding I	4
WELD 1810	Pipe Welding II	4
WELD 1815	Pipe Welding III	4
Semester hours total:		18
<b>Total Program Semester Hours</b>		<b>41</b>

**E. New course prefixes:**

1. Recommended Level of Instruction if the community college is using a new course prefix:

\_\_\_\_\_ No new prefixes

3 Suggested level of instruction

2. New Course prefixes, numbers and titles have been coordinated:  
with UW (transfer) \_\_\_\_\_ Yes \_\_\_\_\_ No  Not Applicable

or WCCC (career technical)  Yes \_\_\_\_\_ No \_\_\_\_\_ Not Applicable

**F. New course descriptions:**

The following are course descriptions for each new course in the program (include prefix, course number, title, credit hours and description):

**WELD 1655 Allied Cutting Processes (3 CH)** - Students will set up equipment and performing cutting and gouging operations utilizing the oxy fuel, air carbon arc, and plasma arc cutting processes. This course will also provide an introduction to blueprint reading.

**WELD 1756 Shielded Metal Arc Welding II (4 CH)** - Students gain knowledge about equipment and setup, electrodes, and electrode selection used in shielded metal arc welding, utilizing the American Welding Society standards of acceptability to develop manual skills necessary to produce quality single and multiple pass welds in all positions using filler metals such as low hydrogen, non-low hydrogen, and iron powder electrodes commonly used in the welding industry.

**WELD 1805 Pipe Welding I (4 CH)** - Students gain knowledge about equipment and setup, electrodes, and electrode selection used in shielded metal arc welding, utilizing the American Welding Society standards of acceptability to develop manual skills necessary to produce quality single and multiple pass welds in 2G and 5G pipe positions using filler metals such as low hydrogen, non-low hydrogen, and iron powder electrodes commonly used in the welding industry.

**WELD 1810 Pipe Welding II (4 CH)** - Students gain knowledge about equipment and setup, electrodes, and electrode selection used in shielded metal arc welding, utilizing the American Welding Society standards of acceptability to develop manual skills necessary to produce quality single and multiple pass welds in 6G SMAW pipe and 2G GTAW pipe positions using filler metals such as low hydrogen, non-low hydrogen, and iron powder electrodes commonly used in the welding industry.

**WELD 1810 Pipe Welding III (4 CH)** - Students gain knowledge about equipment and setup, electrodes, and electrode selection used in shielded metal arc welding, utilizing the American Welding Society standards of acceptability to develop manual skills necessary to produce quality single and multiple pass welds in 5G and 6G pipe positions using filler metals such as low hydrogen, non-low hydrogen, and iron powder electrodes and GTAW welding process commonly used in the welding industry.

**G. Can this program be delivered by current faculty?** If not, what are the plans, budget and timeline for bringing on needed instructors?

Yes.

**H. Summary of input from and coordination with citizens, business and industry or k-12 education:**

LCCC has worked closely with local industries, the Wyoming State Government (Department of Workforce Services), Laramie County School District 1 (LCSD 1), Laramie County School District 2 (LCSD 2), Cheyenne Leads and the Wyoming Business Council to gauge the level of interest in starting a program of study in Welding Technology. LCCC administrators met with two large metal fabrication firms in 2012; one (Searing Industries) indicated the need for welders. Another firm located in Texas also outlined its need for trained welders to support plant operations in Wyoming. F.E. Warren AFB civil engineers also indicated a need for welders to refabricate missile silo work cages used by technicians to maintain and service Minuteman III ICBMs located at the 90<sup>th</sup> Missile Wing. LCSDs 1 and 2 voiced support for a welding program at LCCC because it would offer another avenue to technical students graduating from Laramie Counties high schools to pursue welding technology to support oil and gas development locally along with development of wind projects throughout Wyoming, a welding program in Southeast Wyoming is needed to support local area needs.

**I. Resources required** to start and sustain the program and the current plan to meet those resource needs through college or other external funds:

None. Required resources are currently in place.

**J. Projected demand in Wyoming and Nation** for five years from the proposed implementation date (career technical programs):

1. State and National Trends

United States	Employment		Percent Change	Job Openings
	2012	2022		
Welding Technician	357,400	378,200	+6%	10,850
Wyoming	Employment		Percent Change	Job Openings
	2010	2020		
Welding Technician	1,840	2,180	+18%	210

**Source:**

- **National Data Source:** Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2010-11 Edition*, Fitness Workers, on the Internet at <http://www.bls.gov/oco/ocos287.htm>
- **State Data Source:** Wyoming Department of Employment Research & Planning [http://doe.state.wy.us/lmi/proj2005/long\\_occ2014.htm](http://doe.state.wy.us/lmi/proj2005/long_occ2014.htm)

Other trend information that would assist the Commission:

2. State and National Wages

Location	Pay Period	2013				
		10%	25%	Median	75%	90%
United States	Hourly	\$12.01	\$14.51	\$17.66	\$21.94	\$27.46
	Yearly	\$25,000	\$30,200	\$36,700	\$45,600	\$57,100
Wyoming	Hourly	\$14.77	\$18.04	\$22.18	\$28.61	\$35.23
	Yearly	\$30,700	\$37,500	\$46,100	\$59,500	\$73,300

**Source:** Bureau of Labor Statistics, Occupational Employment Statistics Survey

- **National Data Source:** <http://www.bls.gov/oes/2008/may/oes151051.htm>
- **State Data Source:** [http://www.bls.gov/oes/oes\\_dl.htm](http://www.bls.gov/oes/oes_dl.htm) State Cross-Industry Estimates

Other wage information or comments that would assist the Commission:

3. Primary student audience identified for this program:

Initially, LCCC anticipates the majority of students will be non-traditional and in search of a change in careers. Further, we anticipate the bulk of the non-traditional students will come from a technical career field somewhere within the Rocky Mountain region. The non-traditional students will come not only from Southeast Wyoming but from the Nebraska Panhandle as well. As the program matures, LCCC expects an increase in traditional student enrollment along with USAF personnel who seek post-military employment in the region.

4. Anticipated enrollment in the three academic years after WCCC approval (unduplicated headcount) with the basis for the estimate:

12-15 Year One

12-15 Year Two

20-30 Year Three

**K. Student recruitment and program marketing strategies to attract the broadest range of individuals for this particular program:**

LCCC has created a Welding Technology Advisory Board that has given assistance in marketing the program in the local area. In addition, LCCC academic advisors, LCSD 1 and LCSD 2 school counselors will assist in the promotion of the Welding Technology program at LCCC.

**L. Identification of similar programs at Wyoming Community Colleges and an overview of results of discussions with faculty and administrators at the relevant colleges regarding curriculum and possible joint projects:**

<b>Wyoming Community College Programs</b> <b>(Identify title, degree/certificate and number of credit hours)</b>						
<b>Casper College</b>	<b>Central Wyoming College</b>	<b>Eastern Wyoming College</b>	<b>Laramie County Community College</b>	<b>Northwest College</b>	<b>Northern Wyoming Community College District</b>	<b>Western Wyoming Community College</b>
Welding Technology/ AAS/ Certificate	Welding/ AAS/ Certificate Min. of 64/31 Hours	Welding and Joint Technology /AAS/ Certificate/ Min. of 64/31 Hours	Welding Technology/ AAS/Basic Welding Certificate/ Advanced Welding Certificate 63/20/19	Welding Technology /AAS/Basic Welding Certificate/ Advanced Welding Certificate 63/20/19	Welding Technology/ AAS/ Certificate/ 72/37 Hours	Welding Technology/ AAS/ Certificate/ 68/33 Hours

**M. Note available program and course articulations** with other likely transfer institutions in the region, particularly for transfer AA and AS programs. (Note regional Bachelor of Applied Science transfer options in addition to UW.)

None.

**N. When appropriate, note partnerships with business, industry, associations or agencies** that have contributed to the design of the proposed program and/or who will contribute to the delivery of the program.

LCCC is using an approved course of program study from Gillette College, WY. LCCC administrators have visited the welding facilities at Gillette College and will use that layout to design the LCCC welding program. As previously mentioned, potential industry partners have been contacted to assist with meeting their requirements to meet industry needs of the local area.

**O. Assessment of student learning and completer follow-up per performance indicators.** How will the assessment outcomes be used to assure student learning and improve the program?

Students will be able to:

- Operate safety equipment and use safe work habits

- Weld components in flat, vertical and overhead positions
- Ignite torches or start power supplies and strike arcs by touching electrodes to metals being welded, completing electrical circuits.
- Clamp, hold, tack-weld, heat-bend, grind or bolt component parts to obtain required configurations and positions for welding.
- Detect faulty equipment operation(s) or defective material
- Operate manual or semi-automatic welding equipment to fuse metal segments using a variety of industry standard processes/procedures (GTAW, GMAW, SMAW, GTAW, OAC, TB, etc.)
- Monitor the fitting, burning and welding processes/procedures to avoid overheating of parts or warping, shrinking, distortion or expansion of metal.
- Examine work pieces for defects and measure work pieces with straightedges or templates to ensure conformance with specifications.
- Lay out, position, align and secure parts and assemblies prior to assembly, using straightedges, combination squares, calipers and rulers.

Student assessments will consist of knowledge assessments, daily/weekly assignments and lab projects for specific knowledge skills. In addition, employer surveys and the LCCC graduate feedback form sent out six months after graduation will also be used to assess the program of study.

**P. Other program information or comments** that would assist the commission in making a decision using the Guidelines for Use of this Evaluation Tool found in Appendix A of the 2010 WCCC Statewide Strategic Plan.

This program addresses Wyoming and regional interests in the following ways:

**EDUCATED CITIZENRY** – The proposed Welding Technology program at LCCC will enhance the number of qualified welders needed to support new metal fabrication industries locating in the region along with emerging industries like the development of oil and gas extraction. In addition to welding technology degree and certificate opportunities, a welding program at LCCC would provide community support for welders who need/want to upgrade their skill set to meet industry and code specifications.

**DIVERSIFIED ECONOMY** – The education and training gained by students in the welding technology program will directly support the metal fabrication industry needed to support current operations like



Union Pacific Railroad and emerging industries to include oil and gas extraction.

**WORKFORCE DEVELOPMENT** – The curriculum selected to educate and train students at LCCC is based on the approved one from Gillette College, WY. This curriculum was chosen because it best fits the needs of the local area’s current and emerging industries that require skilled and qualified welders. Through the Welding Technology program, LCCC will provide employees in the existing welding workforce with opportunities to upgrade their skills as well as earning a degree and certificate opportunities.

**EFFICIENT SYSTEMS** – LCCC employs career pathway coordinators who work closely with industry and educational partners to create templates that show how a student (traditional or non-traditional) can prepare for a welding technology AAS degree or certificate. In addition, internal college program reviews and assessments will provide valuable data from which improvements can be made on a continuous basis.

**ACCOUNTABILITY and IMPROVEMENT** – Input from the LCCC Welding Advisory Board, along with lab and classroom assessments and annual internal reviews from students, instructors, and administrators will provide data to improve curriculum and lab delivery. LCCC anticipates industry input to review the welding program of study for continuous quality program improvement much like it does with other technical programs offered by the College.

#### **OTHER CRITERIA-**

- Labor Needs – According to O-NET, it is estimated that an 18% increase in Wyoming’s workforce will be needed to meet industry’s needs for qualified welders from 2010 to 2020. Locally, based on conversations that LCCC administrators have had with Cheyenne and state economic developers as well as face to face meetings with metal fabricators looking to relocate to Southeast Wyoming, the College thinks the need to be higher than O-NET projection for Wyoming.
- Curriculum Development – As shown above, LCCC will use the approved program of study for Welding Technology from Gillette College, WY. This matched the closest for what industry expectations are for a welding program at LCCC. LCCC has received a copy of the Welding Technology AAS Degree and Certificate programs of study from Gillette College.

- Pathways – Like all programs at LCCC, a career pathway template will be developed by LCCC career coordinators who work closely with industry experts and high school counselors. The template will be a useful advising tool to help traditional and non-traditional students prepare for their degree or certificate in welding technology.
- Faculty Support – LCCC will request one additional faculty member to assist teaching and developing the welding technology program of study.
- Recruitment Strategies – As previously stated, aggressive recruiting will be done through a variety of methods including: (1) LCCC academic advisors working with local area high school counselors in LCSD 1 and LCSD 2; (2) actively using local media outlets including TV, radio and newspaper.
- Resource Needs – A 2,000 square foot addition has been built onto the current Career and Technical Building to house the welding technology program until the voter approved Industrial Technology Building is completed. The current facility can train 15 students during an instructional session. However, upon completion of the Industrial Technology Building, the student welding booths will be expanded to approximately 35 positions.

## SIGNATURE PAGE

Submitted by V. P. for  
Academic Affairs\*

\_\_\_\_\_  
Signature Date

\_\_\_\_\_  
Printed Name Title

Approved by the WCC Academic  
Affairs Council

\_\_\_\_\_  
Signature Date

\_\_\_\_\_  
Printed Name Title

Approved by Program  
Review Committee

\_\_\_\_\_  
Signature Date

\_\_\_\_\_  
Printed Name Title

\*Signature by the Community College Vice President for Academic Affairs verifies that institutional curriculum approval processes have been completed and that the Community College Board of Trustees has approved this program request as per institutional policy.