

Welding Engineering Technology

(A Division of the Mechanical Engineering Department)



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<http://www.byui.edu/mechanical-engineering>

The Welding Engineering Technology Program offers the following degree, minor and cluster options:

- 4 – Year Bachelor of Science in Welding Engineering Technology (473)
- 4 – Year Bachelor of Science in Welding Fabrication and Technology Management (474)
- 2 – Year Associate of Applied Science in Welding Fabrication and Technology (374)
- Minor in Welding Fabrication and Technology (217)
- Cluster in Welding (6302), Cluster in Fabrication (6303)

Welding Engineering Technology (473)

The Welding Engineering Technology BS degree prepares students for professional careers in a wide range of welding industries including: shipbuilding, agriculture, heavy equipment, automotive, aerospace, motorized recreation equipment, industrial equipment, material handling, welding equipment, etc. Welding engineers are involved in a variety of activities such as design, automation, inspection, quality, problem solving, teamwork, improving manufacturing efficiencies, sales, marketing, trouble-shooting, etc. The Welding Engineering Technology degree requires students who enjoy a hands-on approach as well as the challenge of engineering. Students in Welding Engineering Technology will learn the science and language of welding and engineering so that they will be able to span the gap between design and manufacturing. The Welding Engineering Technology BS degree is available on the Fall/Winter and Winter/Spring tracks.

Student Outcomes

1. Select and execute the correct welding process for a given application. [Welding Processes]
2. Accurately interpret and apply welding inspection procedures and code standards. [Inspection and Codes]
3. Apply practical knowledge of mathematics, science, engineering, and technology to engineering technology problems. [Engineering Fundamentals]
4. Design, model, and fabricate components using modern CAD/CAM and other software tools and appropriate manufacturing processes. [CAD/CAM Tools]
5. Demonstrate extensive practical experience with a variety of manufacturing processes and advanced manufacturing technologies. [Manufacturing Processes]
6. Understand tools and methods for measuring quality, and develop and implement effective quality systems in a manufacturing enterprise. [Manufacturing Quality]
7. Be proficient at exhibiting leadership. [Leadership]
8. Function as a contributing team member in a technical work/product development environment. [Team Work]
9. Learn and apply ethical principles in industry/business settings. [Ethics]
10. Competently present technical findings in both oral and written format. [Communication]

Welding Fabrication and Technology Management (474)

The Welding Fabrication and Technology Management BS degree prepares graduates for career opportunities in managing the operations of welding-related businesses and industries including manufacturers, welding equipment producers, suppliers, and other technology-oriented companies. It is also a great preparation for becoming a business owner or entrepreneur. The Welding Fabrication and Technology Management BS degree is available on the Fall/Winter and Winter/Spring tracks.

Student Outcomes

Student Outcomes for the Welding Fabrication and Technology Management Program:

1. Execute the correct welding process for a given application. [Welding Processes]
2. Accurately interpret and apply welding inspection procedures and code standards. [Inspection and Codes]
3. Apply the laws of physical science and math to fundamental design and fabrication problems. [Fundamentals]
4. Design, model, and fabricate components using modern CAD/CAM and other software tools and appropriate manufacturing processes. [CAD/CAM Tools]
5. Competently present technical findings in both oral and written format. [Communication]
6. Function as a contributing team member in a technical work environment. [Team Work]
7. Select the appropriate welding process for an application. [Process Selection]
8. Be proficient at exhibiting leadership. [Leadership]
9. Be proficient at exhibiting innovation in developing business ideas and processes. [Innovation]
10. Proficiently use spreadsheets to do analysis for making business decisions. [Spreadsheets]
11. Learn and apply ethical principles in industry/business settings. [Ethics]

Welding

Brigham Young University-Idaho 2015-2016

Welding Fabrication and Technology (374)

This 2-year associate program provides hands-on training in welding and manufacturing processes. The curriculum includes a solid foundation in welding theory, manufacturing processes, and material science. This program develops skills and is designed for employment in the welding, manufacturing, or fabrication industries. The associate program in Welding Fabrication and Technology is available on the Fall/Winter and Winter/Spring tracks.

General Information

Mathematics and physical sciences are critical components of any manufacturing technology curriculum. The normal entry-level mathematics class for the welding programs is Pre-Calculus (FDMAT 109) or College Algebra (FDMAT 110). Entering freshman students should consult with their advisor to ensure they are beginning with the mathematics course for which they are prepared. Students with weak mathematics skills are advised to enroll in a preparatory mathematics course to strengthen their skills. The normal entry-level chemistry course is Introduction to General Chemistry (CHEM 101).

It is imperative that students develop and follow a plan of study that will allow them to complete all the required courses within the credit hour limits. Students should consult with their advisor/mentor early to make sure their educational plan is correct. Sample curriculum flow charts can be found on the department web page at

<http://www2.byui.edu/MechEng/>.

AAS in Welding Fabrication and Technology (374)

Core Courses <i>Take these courses:</i> CHEM 101 3 CHEM 101L 1 MATH 111 2 ME 101 1 ME 172 3 ME 231 2 ME 231L 1 ME 250 3 ME 250L 1 <i>cont. in next column</i>	<i>cont. from previous column</i> ME 299 1 ME 332 3 PH 105 4 WELD 101 3 WELD 120 3 WELD 123 3 WELD 229 3 WELD 280 3 WELD 350 3 <hr style="width: 100%;"/> 43	Program Notes: <ul style="list-style-type: none"> • <i>No Double Counting of Major Courses</i> • <i>Students must maintain a minimum grade of C- in their major courses</i>
Credit Requirements:		Tracks Available:
Foundations 17 Major 43 Total 60		Fall-Winter Yes Winter-Spring Yes Spring-Fall No

BS in Welding Engineering Technology (473)

Core Courses <i>Take these courses:</i> MATH 330 3 ME 172 3 ME 201 2 ME 202 3 ME 231 2 ME 231L 1 ME 331 3 ME 332 3 ME 250 3 ME 250L 1 FDMAT 112 4 <i>cont. in next column</i>	<i>cont. from previous column</i> WELD 101 3 WELD 120 3 WELD 123 3 WELD 229 3 WELD 280 3 WELD 350 3 <hr style="width: 100%;"/> 46 Take 4 credits: ME 101 1 ME 142 3 or B 212 4 <hr style="width: 100%;"/> 4	Take 1 course: CHEM 101 3 CHEM 105 4 <hr style="width: 100%;"/> 3 Take 1 course: ECEN 150 3 ME 210 2 <hr style="width: 100%;"/> 2	Interdisciplinary Courses Take 1 course: IDS 398R 1-3 ME 398R 1 <hr style="width: 100%;"/> 1 Take 1 course: IDS 499 2 ME 340 3 <hr style="width: 100%;"/> 2	Program Notes: <ul style="list-style-type: none"> • <i>No Double Counting - No Grade Less Than C- for Major Courses</i>
Credit Requirements:		Tracks Available:		
Foundations 40 Major 58 Elective 22 Total 120		Fall-Winter Yes Winter-Spring Yes Spring-Fall No		

Welding

Brigham Young University-Idaho 2015-2016

BS in Welding Fabrication and Technology Management (474)

Entry Courses <i>Take these courses your first 2 semesters:</i>	Core Courses <i>Take these courses:</i>	<i>cont. from previous column</i>	Supplemental Courses <i>Take 1 course:</i>	<i>Program notes:</i>
ME 172 3	ACCTG 180 3	MATH 221A 3	B 398 1-3	<ul style="list-style-type: none"> •No Double Counting of Major Courses • Students must maintain a minimum grade of C- in their major courses
ME 231L 2	B 101 3	ME 250 3	ME 299 1	
ME 231L 1	B 301 3	ME 331 3	ME 398R 1	
WELD 101 3	B 321 3	ME 332 3	1	
WELD 101 3	B 341 3	PH 105 4		
9	B 361 3	WELD 120 3		
	CHEM 101 3	WELD 123 3		
	ECON 150 3	WELD 229 3		
	MATH 111 2	WELD 280 3		
	<i>cont. in next column</i>	WELD 350 3		
		57		

Credit Requirements:

Foundations	40
Major	67
Elective	13
Total	120

Tracks Available:

Fall-Winter	Yes
Winter-Spring	Yes
Spring-Fall	No

Minor in Welding Fabrication and Technology (217)

Core Courses <i>Take these courses:</i>	Technical Electives <i>Take 6 credits:</i>	<i>Program Notes:</i>
ME 231 2	CHEM 101 3	<ul style="list-style-type: none"> •No Double Counting of Minor Courses •Students must maintain a minimum grade of C- in their minor courses
ME 231L 1	CHEM 101L 1	
WELD 101 3	FDMAT 110 3	
WELD 120 3	MATH 111 2	
WELD 123 3	ME 172 3	
WELD 229 3	ME 250 3	
WELD 280 3	ME 332 3	
WELD 280 3	WELD 350 3	
18	6	

Credit Requirements:

Total	24
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Tracks Available:

Fall-Winter	Yes
Winter-Spring	Yes
Spring-Fall	No

Welding Technology Concentration (D 148)

Core Courses <i>Take these courses:</i>	<i>Take 1 course:</i>	Interdisciplinary Courses <i>Take 1 course:</i>	<i>Program Notes:</i>
WELD 101 3	CHEM 101 3	IDS 398R 1-3	<ul style="list-style-type: none"> •No Double Counting of Concentration Courses •No Grade Less Than C- for Concentration Courses
WELD 120 3	CHEM 105 4	ME 398R 1	
WELD 123 3	3	1	
WELD 229 3	<i>Take 1 course:</i>		
WELD 280 3	ECEN 150 3	<i>Take 1 course:</i>	
WELD 350 3	ME 210 2	IDS 499 2	
ME 250 3	2	ME 340 3	
ME 250L 1	2	2	
ME 250L 1	2	2	
22			

Credit Requirements:

Total	30
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Tracks Available:

Fall-Winter	Yes
Winter-Spring	Yes
Spring-Fall	No

Welding Pre-approved Clusters

Welding Cluster	Fabrication Cluster
6302	6303
<i>Take these courses:</i>	<i>Take these courses:</i>
WELD 101 Welding Fundamentals 3	ME 172 Engineering Graphics 3
WELD 123 Advanced Welding Processes 3	ME 231 Manufacturing Processes 1 2
<i>Take 6 credits:</i>	ME 231L Manufacturing Processes 1 1
ME 172 Engineering Graphics 3	WELD 101 Welding Fundamentals 3
ME 231 Manufacturing Processes 1 2	<i>Take 3 credits:</i>
ME 231L Manufacturing Processes 1 Lab 1	ME 331 Manufacturing Processes 2 3
WELD 100 Introduction to Welding 1	ME 332 Computer Numerical Control (CNC) 3
WELD 120 Gas Tungsten Arc Welding 3	WELD 100 Introduction to Welding 1
WELD 229 Code, Certification & Inspection 3	WELD 120 Gas Tungsten Arc Welding 3
WELD 280 Welding Fabrication 3	WELD 123 Advanced Welding Processes 3
Total Credits 12	Total Credits 12

Course Descriptions	Credits*
<p>WELD 100 Introduction to Welding</p> <p>Total Course Fees: \$60.00</p> <p>This class is a basic awareness and career exploration course. It is designed to teach students about welding and how to perform a successful weld on steel. They will also be introduced to career opportunities in the welding and welding engineering fields. Some of the course time will be spent in the classroom, while some will be spent working in the lab with small groups.</p> <p>(Fall, Winter, Spring)</p>	(1:0:2:0)
<p>WELD 101 Welding Fundamentals</p> <p>Total Course Fees: \$95.00</p> <p>A course in beginning welding designed to teach the fundamentals of arc welding including: safety, power sources, electrodes, oxyfuel cutting, and oxyacetylene welding with an introduction to weld symbols, metallurgy, and metal identification.</p> <p>(Fall, Winter, Spring)</p>	(3:2:4:0)
<p>WELD 120 Gas Tungsten Arc Welding</p> <p>Total Course Fees: \$60.00</p> <p>Prerequisites: WELD 101</p> <p>Gas tungsten arc welding of carbon steel, stainless steel, and aluminum alloys. Students will be given instruction on theory and application for welding in all positions using the AWS EG3 standards.</p> <p>(Fall, Spring)</p>	(3:2:4:0)
<p>WELD 123 Advanced Welding Processes</p> <p>Total Course Fees: \$35.00</p> <p>Prerequisites: WELD 101</p> <p>Continued proficiency in the use of arc welding processes in accordance with AWS EG2 (qualifications of welding personnel). This is a competency-based curriculum detailing acceptable skill requirements for entry level welders.</p> <p>(Fall, Spring)</p>	(3:2:4:0)
<p>WELD 229 Code, Certification & Inspection</p> <p>Corequisite: WELD 123</p> <p>Welding procedure, specification, and qualification according to standards of AWS D1.1, ASME Section IX, and API 1104. Interpretation of weldments, NDT inspection methods, and required reports, in accordance with AWS EG4 requirements.</p> <p>(Winter)</p>	(3:2:4:0)
<p>WELD 280 Welding Fabrication</p> <p>Corequisite: WELD 123</p> <p>The use and application of equipment, tools, fasteners, and processes used in fabrication practices in the welding industry. Interpretation of drawings for fabrication of small projects will be explored. Techniques for layout, fitting, squaring, tacking, and fabricating will be developed.</p> <p>(Winter)</p>	(3:2:4:0)
<p>WELD 350 Physical Metallurgy</p> <p>Prerequisite: ME 250</p> <p>A study of physical metallurgy with a focus on application to welding.</p> <p>(Winter)</p>	(3:2:2:0)