Welding Engineering

Welding engineering employs science and engineering in joining components made of metals, ceramics, plastics and other materials. Welding engineering includes design of the joints to be welded, development of the detailed joining procedures to be used, selection of the materials incorporated in the joint, joint inspection and quality control for the final product. Welding engineering can also involve research in these areas, such as developing new welding processes or procedures for new materials. Welding engineers work with design engineers to develop efficient welding designs and fabrication procedures.

Pursuing Welding Engineering at Ohio State

Students may directly enroll as pre-engineering students; however, selection is competitive. Factors used to determine eligibility to directly enroll include ACT/SAT scores (emphasis on math), strong college prep curriculum (emphasis on math, science and rigorous courses), and class rank or GPA.

Students not eligible to directly enroll in engineering may enroll in Science, Technology and Environment Exploration (see exploration.osu.edu).

Acceptance to the major is competitive and based on cumulative point-hour ratio (CPHR) and eligibility point-hour ratio (EPHR). The EPHR is determined from the following courses:

- Materials Science and Engineering 2010
- Engineering 1181 and 1182
- Math 1151 and 1172
- Chemistry 1250
- Physics 1250

Students who have completed English 1110 and who have achieved both a CPHR and an EPHR of 3.0 or higher are assured acceptance into the major.

Program Educational Objectives

The degree program in welding engineering seeks to produce graduates who make meaningful positive contributions to our technological society. Within a few years of graduation, we expect our alumni to have:

1. been appointed to technical, scientific or business position in commercial or nonprofit, government or academic enterprises, or
2. attained or are successfully tracking toward a post-graduate or professional degree;
3. earned recognition for scientific or technical contributions within their employing organizations;
4. become engaged with and contributing to professional societies and organizations.

The student outcomes supporting our educational objectives can be found at go.osu.edu/we_outcomes.

For more information, check these websites:

Welding Engineering: mse.osu.edu
College of Engineering: engineering.osu.edu
Ohio State: osu.edu
Admissions: undergrad.osu.edu
Multicultural Center: multiculturalcenter.osu.edu
First Year Experience: fye.osu.edu

Co-Curricular Opportunities

A strong American Welding Society (AWS) Student Chapter helps provide students with further educational activities. AWS invites professional speakers to meetings and sponsors plant and industry tours. In addition, the student chapter often combines meetings with the local professional AWS Chapter for an even broader range of professional speakers and topics. AWS members help with recruiting events like the annual Open House and provide other services to the department and the program, including operating the bookstore for specialized educational and promotional materials.

Welding engineering students are required to complete a one-term internship before graduation, generally in the summer before the final year. Students are encouraged to plan for other co-op or internship opportunities earlier in their academic career. Co-op and/or internship experience not only helps a student earn high wages toward their academic expenses, but also helps them use the knowledge gained to decide in which area, if any, they may wish to concentrate their technical electives, and/or whether graduate work would be appropriate. Students often receive job offers upon graduation from companies with which they had a co-op or internship.

Honors & Scholars Programs

Ohio State offers the Honors and Scholars programs to create an environment of intellectual support and stimulation within a close-knit community of high-ability undergraduate students. Through these programs, students have access to smaller classes, undergraduate research opportunities, close working relationships with faculty, priority scheduling and unique housing options.

Honors and Scholars programs represent great opportunities to be part of a smaller community within a large university. Learn more at honors-scholars.osu.edu.

Honors students may choose to use the Senior Petition, which allows a student to receive graduate credit for up to 9 credit hours of work taken while a senior which is not required as part of their undergraduate program. In addition, each year many welding engineering Honors students are admitted to the combined BS/MS degree program, which allows a student with at least a 3.5 cumulative grade point average to be admitted to graduate school during their senior year and to count up to 9 hours of course work toward both their graduate and their undergraduate degrees, which then shortens the time-to-degree for the master’s degree.
Career Prospects in Welding Engineering

Welding engineers are involved in research and development, production, construction, and inspection functions involving welded fabrication. They also work in consulting, teaching, management, sales and service functions. There are also opportunities to be owners or partners in private sector businesses.

As the world becomes more conscious of the environment and the need for conservation of natural resources, many new opportunities are available for welding engineers. These opportunities include the design and manufacture of automobiles, trucks and airplanes that are lighter, safer and more fuel efficient, with improved environment control systems. The exploration of space brings the opportunity of designing and manufacturing space probes and space shuttles. Welding engineering is a growing profession, and it is expected to continue in this growth for many years. Beginning salaries for welding engineers range from $58,000 to $70,000, with an average in the low $60,000s, depending on individual qualifications.

More About Welding Engineering

The Ohio State University welding engineering program offers students a unique opportunity because it is the only accredited welding engineering program in the United States offering bachelor’s, master’s, and doctorate degrees in welding engineering. Because of this, the program has been recognized throughout the industry as a leader in welding education and research. Graduates are highly recruited for their diverse educational background. Professors in the program have worldwide reputations as leaders in their respective areas for their vast experience and research. One of the advantages of the welding engineering program is that it is relatively small, allowing greater student-professor interaction.

Curriculum Sample

This is a sample list of classes a student will take to pursue welding engineering. Since university students need more than specific education in a narrow field, they also will take classes to complete General Education (GE) requirements. Because GE courses come from a variety of academic areas of study, this course work helps students develop fundamental skills essential to collegiate success and allows them to tailor these courses toward their interests. Note: This sample represents one of several possible paths to a degree in Industrial and Systems Engineering. Note: This sample represents one of several possible paths to a degree in welding engineering. Consult the departmental website, mse.osu.edu, for details.

Freshman Year:
Survey course 1
Introduction to Engineering 4
Math 10
Physics 5
Chemistry 4
GE courses 9
Total hours 33

Sophomore Year:
Introduction to Materials Science 3
Physics 5
Differential Equations 4
Electrical Circuits 3
Programming and Simulation 2
Statics and Strength of Materials 4
Thermodynamics 3
Survey of Welding Engineering 3
Intro to Arc Welding Lab 1
GE courses 6
Total hours 34

Junior Year:
Structure and Transformation of Materials 3
Materials and Processes Lab 2
Physical Principles in Welding I, II and Labs 8
Analysis for Design and Simulation 4
Welding Engineering Design 3
Welding Metallurgy and Lab 4
Nondestructive Evaluation and lab 3
Fundamentals of Manufacturing Engineering 3
GE courses 3
Total hours 33

Senior Year:
Welding Metallurgy II and lab 4
Industrial Experience 1
Welding Capstone Design I and II 5
Engineering Economics 2
Technical electives 9
GE courses 9
Total hours 30

Ohio State’s welding engineering program is accredited by the Engineering Accreditation Commission of ABET, abet.org.

Revised August 2015. Information subject to change. For the most up-to-date information on the welding engineering major, visit mse.osu.edu.

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