



# Physical Metallurgy:

## Processing, Properties, and Performance of Engineering Metals Program

*Offered on-campus with a distinct focus on engineering alloys*

*Ideal for working engineers or graduate students with undergraduate degrees in other engineering sub-specialty areas, the Graduate Certificate in Physical Metallurgy curriculum focuses on core physical metallurgy principles while incorporating modern and emerging topics.*

### WHY STUDY PHYSICAL METALLURGY AT THE UNIVERSITY OF PITTSBURGH?

The Swanson School of Engineering's Graduate Certificate Program in Processing, Properties, and Performance of Engineering Metals is designed to meet the ongoing workforce development needs for materials engineering professionals with expertise in physical metallurgy. This program provides students the ability to study a specialized and critical industry sector in a region that has advanced manufacturing capabilities in primary metals, metal fabrication, and precision manufacturing.

Known as the "Steel City," the region is one of the country's most concentrated areas in primary metals, with Pittsburgh ranking as the 6th largest metal exporting city in the United States\* and also as a top-10 metropolitan area with the highest employment level for this occupation, with over 83,400 manufacturing jobs.\*\* With a strong history as a center of metals, the region has transformed into an area complete with exceptional supplier networks, world-class research facilities, abundant energy resources, road and rail infrastructure, and diverse job opportunities.

The Swanson School of Engineering is proud to collaborate and work with top industry partners, as well as individuals employed in leadership positions at the national level. With this specific focus on physical metallurgy, our Department of Mechanical Engineering and Materials Science is well positioned to drive and support workforce development in the areas of metals production and processing.

\* <http://www.catalystconnection.org/news/pittsburgh-still-steel-city/>

\*\* <https://www.bls.gov/oes/current/oes172131.htm>

\*\* [https://www.bls.gov/regions/mid-atlantic/news-release/areaemployment\\_pittsburgh.htm](https://www.bls.gov/regions/mid-atlantic/news-release/areaemployment_pittsburgh.htm)

### ADMISSIONS REQUIREMENTS

BS in an engineering field from an ABET-accredited university program,

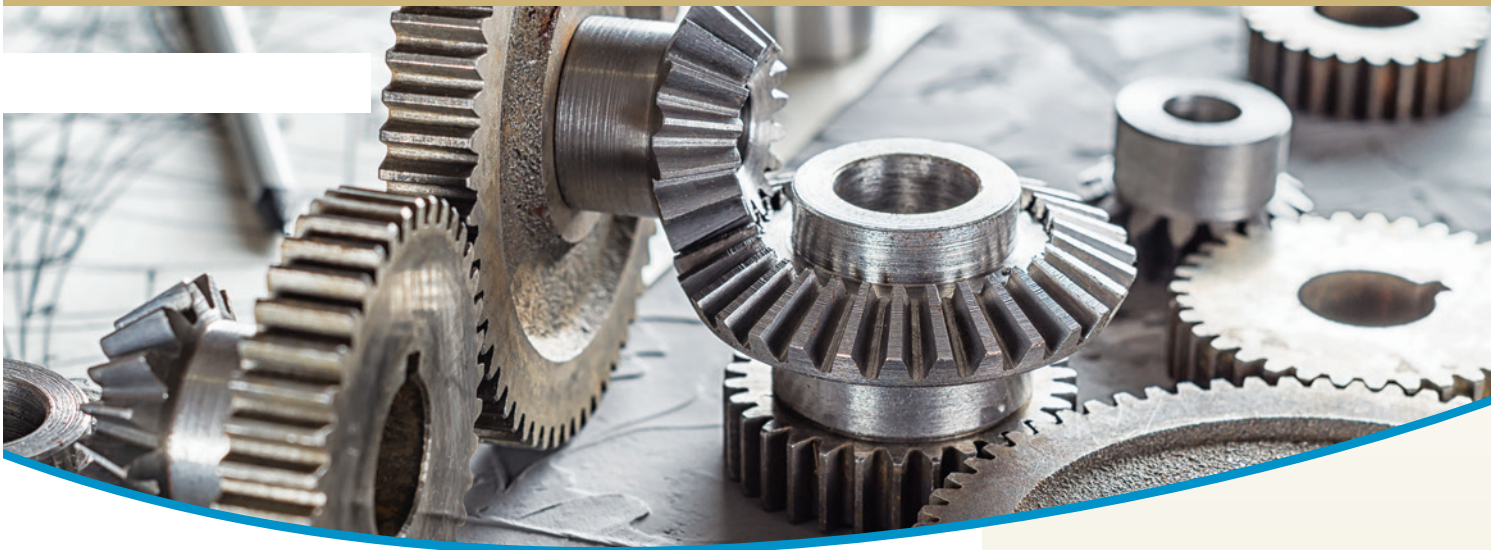
#### OR

BS in other physical science field.

**NOTE:** *Candidates with other educational and professional backgrounds will be considered on an individual basis with strong emphasis given to academic promise, career orientation, work experience, and preparation in engineering and related disciplines. Additional coursework may be required to ensure skill set necessary for success in the program.*

### FOR MORE INFORMATION

[engineering.pitt.edu/  
PhysicalMetallurgy](http://engineering.pitt.edu/PhysicalMetallurgy)



## Physical Metallurgy:

### Processing, Properties, and Performance of Engineering Metals Program *(continued)*

This program combines five distinct yet cohesive courses, an ideal match for students whose goal is to acquire advanced physical metallurgy knowledge. The aim of the curriculum is to provide opportunities for students to expand their know-how in areas such as compositions, microstructures, and various technical metals properties and processing methods. This certificate program can be completed individually OR combined with an MS program with advisor approval.

#### DELIVERY

- On-Campus

#### TOTAL CREDITS

- Certificate – 15

#### ENTRANCE EXAM

- None Required\*

#### ADDITIONAL ADMISSIONS REQUIREMENTS

- Two Letters of Recommendation
- Unofficial Transcripts

\*Applicants from non-ABET accredited programs may have to complete the GRE

#### Required for Graduate Certificate

MSE 2067	Elements of Materials Science and Engineering
MSE 2030	Mechanical Behavior of Materials
MSE 2031	Metal-Forming Processes
MSE 2090	Corrosion and Failure Analysis
MSE 2047	Analysis and Characterization at the Nano Scale

Within the Pittsburgh metropolitan area, there are approximately three dozen specialty metal or steel companies, and hundreds of other specialty steel manufacturers, processors, fabricators, and related companies within a 100 mile radius of Pittsburgh making study of Physical Metallurgy at the University of Pittsburgh ideal for students who want to learn in a region positioned to impact the future of this field.\*\*\*

\*\*\* <http://www.pgtech.org/news-publications/state-of-the-industry-report/specialty-metals-in-the-pittsburgh-region.aspx#.W0RxHGzNPM>

The schedule of classes currently offered are listed on our website at [engineering.pitt.edu/courses](http://engineering.pitt.edu/courses)

For more information about our Graduate Metals Engineering Programs, please contact:

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#### University of Pittsburgh

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10/18