

# STEM CAREERS for Solid Futures— Can you see yourself in MSE?

Explore how you can turn curiosity into a career. With so many exciting paths, Materials Science and Engineering (MSE) could be your launchpad to changing the world—one amazing material at a time.



**What do sneakers, smartphones, and even jet engines have in common?** They all rely on advanced materials to work better, faster, and stronger. That's where Materials Science and Engineering (MSE) comes in. MSE is all about figuring out what stuff things should be made of—whether it's designing super-strong metals for spaceships, creating eco-friendly plastics, or even 3D-printing human organs. Cool, right?

If you're into science, love solving problems, or just want to help build the future, MSE might be your perfect match. It's a hands-on field that blends creativity and innovation with cutting-edge technology. And the best part? Materials scientists and engineers are needed in every industry—from fashion and sports to aerospace and medicine.

# MATERIALS IN...

## MEDICINE

Ever wonder how prosthetic limbs or surgical tools are made? It all starts with choosing the right materials—that's where Materials Science and Engineering (MSE) comes in. It's not guesswork; it takes deep knowledge, creativity, and a passion for helping people. MSE experts design materials that are strong, biocompatible, and resistant to bacteria to create life-changing medical devices—like artificial joints, surgical clamps, and implants. By combining science, problem-solving, and innovation, MSE plays a vital role in advancing healthcare. If you want to make a real impact, MSE offers a path to improve lives—one material at a time.



## SPORTS

What's your favorite sport—basketball, soccer, tennis, or track? Behind every game, Materials Science and Engineering (MSE) plays a key role. From the bounce of a basketball to the grip of cleats, MSE experts design materials that boost performance. They create gear that's lightweight, strong, flexible, and built to win—like custom-fit sneakers or perfectly balanced soccer balls. MSE is where science meets sport, helping athletes push their limits. If you love sports and science, this is your arena. Join the team that engineers the future of athletics—because innovation wins championships, both on and off the field.



## AGRICULTURE

MSE is transforming how we grow food and protect the environment. One exciting innovation is biodegradable polymers—materials that break down naturally and help reduce pollution. These smart materials can replace harmful plastics, protect crops from pests, retain water in soil, and even trap pollutants before they reach plants. By designing eco-friendly solutions, MSE experts are making farming cleaner, greener, and more efficient. If you care about sustainability, the environment, and feeding the world in better ways, Materials Science and Engineering could be your path to meaningful impact—one material, one solution, one harvest at a time.



## ENERGY

Energy powers everything—from your phone to entire cities. Want to help make it cleaner and more efficient? Materials Science and Engineering (MSE) is key. MSE experts develop materials that conduct and store energy better, fueling advances in batteries, solar panels, and more. As the world shifts to renewable energy, MSE is shaping the future—making green tech smarter and more sustainable. With AI's demand rising 2-3% already, smarter energy solutions are more necessary than ever. If you care about energy, tech, and the planet, MSE offers a powerful way to make a lasting impact. MSE could help you make a real impact on the planet's energy future and drive innovation in tech.



## Failure Analysis

In Materials Science and Engineering (MSE), failure isn't a setback—it's a learning opportunity. Failure analysis helps engineers understand why materials or products break down, like a cracked phone screen or a collapsed bridge. By studying stress, cracks, corrosion, and fatigue, MSE professionals pinpoint the causes of failure. This analysis leads to redesigning materials and products to be safer, stronger, and longer-lasting. In MSE, failure is a chance to innovate, turning mistakes into better solutions for the future.

## GROUND TRANSPORTATION

Efficient ground transportation is a major challenge—and Materials Science and Engineering (MSE) is helping solve it. MSE experts design materials that make vehicles lighter, stronger, and more energy-efficient, whether for traditional cars or electric vehicles. They also play a critical role in the oil and gas industry, selecting and testing materials that keep pipelines safe from corrosion as they carry fuel across land and sea. From safer, more efficient vehicles to better EV batteries and durable infrastructure, MSE is driving the future of transportation. If you're into innovation and impact, MSE could be the road you take.



## AEROSPACE

Ever dream of exploring space or advancing flight technology? Materials Science and Engineering (MSE) makes it possible. MSE experts design strong, lightweight materials that help airplanes and rockets fly farther, faster, and more efficiently. By mastering metal alloys and composites, they create materials that can withstand extreme heat, pressure, and the rigors of space travel—like those used in aircraft wings or spacecraft reentry shields. MSE is key to pushing aerospace innovation forward. If you're passionate about space, aviation, or cutting-edge tech, MSE offers a path to help explore new frontiers and shape the future of flight.



## TECHNOLOGY

Did you know Materials Science and Engineering (MSE) plays a key role in communications? Whether it's sending data, making calls, or streaming videos, it all comes down to materials. MSE experts understand which materials conduct signals best, ensuring technology works seamlessly. From smartphones to laptops, every device relies on MSE. Materials scientists choose the right metals to develop microelectronics and semiconductors that enable devices to connect and function. If you're passionate about tech and want to shape the future of communication and innovation, MSE is the field for you.



## SALARIES WITH A BACHELORS DEGREE IN MATERIALS SCIENCE AND ENGINEERING



Source: U.S. Bureau of Labor Statistics



Imagine creating the perfect material in seconds! Thanks to Integrated Computational Materials Engineering (ICME), this is becoming a reality. Instead of hours of testing, scientists input their needs into a computer, which quickly identifies the best material options. Using data from past experiments, MSE professionals can fast-track new discoveries, impacting fields like electronics and aerospace. If you're passionate about tech, problem-solving, and innovation, MSE and ICME offer an exciting path to shaping the future.

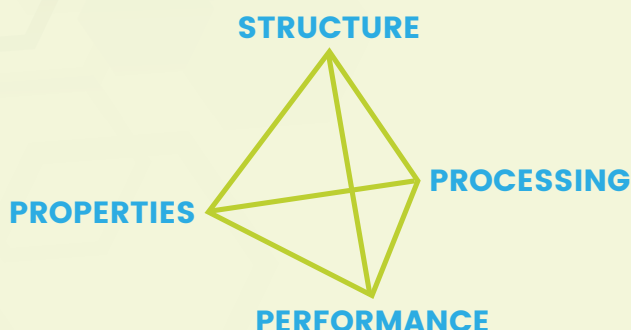


# Want to change the world with science and innovation?

A career in Materials Science and Engineering (MSE) offers endless possibilities. Whether you're into designing cutting-edge tech or developing new materials, MSE has something for everyone. The first step is figuring out which path suits you. If you enjoy hands-on work, welding could be a great fit, and a tech school can help you get there. If you dream of becoming an engineer, a four-year college is the way to go. MSE is all about following your passion, with room for growth, creativity, and global impact.



If you're planning a future in STEM take as many math and science courses as you can in high school. Courses like Chemistry, Physics and Calculus will provide the foundation for college and beyond. These classes build problem-solving skills, critical thinking, and prepare you for lab work or real-world projects. Challenging yourself now sets you up for success in competitive majors, internships, and careers. Even if you're unsure about your field of study, a strong background in math and science keeps your options open.



At the core of Materials Science and Engineering (MSE) is the tetrahedron—a model that connects a material's structure, properties, processing, and performance. MSE professionals use this tool to create and improve everyday products. They combine science and creativity to work with materials like metals, plastics, ceramics, and composites, designing everything from flexible sports gear to durable phone screens to heat-resistant rocket shields. Understanding how materials work is a valuable skill in high demand. If you're curious, creative, and love problem-solving, MSE could be your path to shaping the future.

## Who We Are

The ASM Materials Education Foundation (ASM MEF) inspires, engages, and empowers future generations to create STEM solutions for 21st century challenges. For 70 years, the ASM Materials Education Foundation has promoted Materials Science education and career opportunities to both students and teachers. The Foundation funds undergraduate scholarships and numerous educational outreach activities, supplies grants to teachers for classroom projects, and operates our signature program—ASM Materials Camps®.

**Start your journey today—who knows what amazing things you'll create tomorrow!**

### INTERESTED IN LEARNING MORE?

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