

# SME , STEM, and the Future of Manufacturing



# 2015 Texas HTEC

Presented By

Wayne Mausbach March 6, 2015

EVERYONE YOU NEED TO ...

MEET

EVERYTHING YOU NEED TO ...

KNOW

EVERYTHING YOU NEED TO ...

GROW

# “Houston...We have a Problem”

Jim Lovell Apollo 13

- Baby Boomers Retiring
- Off-Shoring Jobs due to Bad Economics
- Lost interest in STEM Education
- Students not wanting “Dirty Jobs”
- Expense of Higher Education Prohibitive

“Since 1970  
100 % of the 40% increase in  
real buying power was  
produced by the educated  
work force”

**Jesse Thompson** Business Economist  
Federal Reserve Bank of Dallas



# Toyota San Antonio

**“We have 3000 highly skilled Technicians here only 30 who are Engineers “**

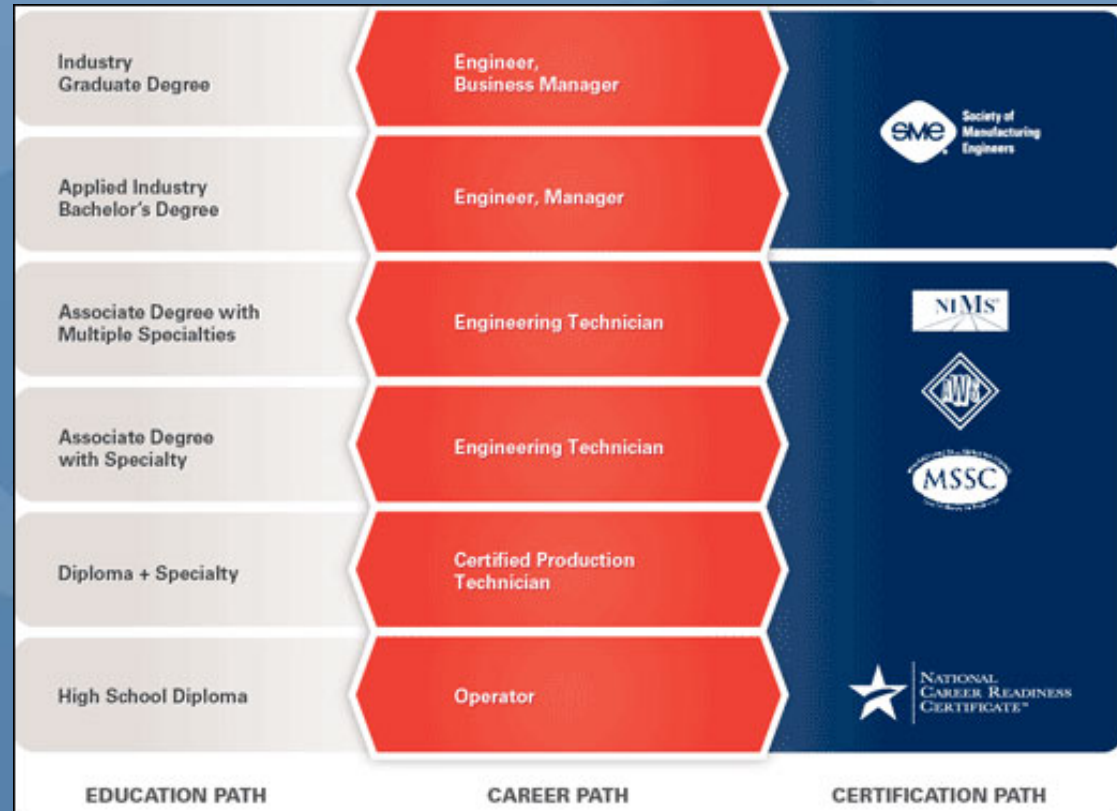
**Mario Lozoya Director**

The Future is Collaboration



# NAM-Endorsed Skills Certification

Manufacturing  
Career Pathway  
Starts Here



The Employment and Training Administration convened a group of leading industry organizations to develop a comprehensive competency model framework for advanced manufacturing. The framework is designed to evolve along with changing skill requirements and maps to the Department of Labor's Advanced Manufacturing Competency Model.

# SME AT A GLANCE

## Who is SME?

- Manufacturing practitioners
- Industry experts
- Academics
- Students
- Entrepreneurs (of all size companies)

***All of us are working together to support the manufacturing community with vital services.***



Student Membership \$ 20



# SME 2017 Strategic Plan

## CORE VALUES:

- ✓ ACCOUNTABILITY
- ✓ COLLABORATION
- ✓ CUSTOMER FOCUS
- ✓ EXCELLENCE
- ✓ INNOVATION
- ✓ INTEGRITY
- ✓ PASSION

## OUR STAKEHOLDERS:

We engage with stakeholders globally, including:

- ❖ Companies, Educators, Government and Communities
- ❖ Members, Students and Practitioners
- ❖ Current and Future Manufacturing Workforce

## VISION

*Enhance progress, prosperity and strong communities through manufacturing.*

## MISSION

*Inspire, prepare and support our stakeholders in the advancement of manufacturing.*

## PURPOSE

*Advance manufacturing and attract future generations.*

EVENTS

MEMBERSHIP

PROFESSIONAL  
DEVELOPMENT

EDUCATION  
FOUNDATION

MANUFACTURING  
ENGINEERING  
MEDIA

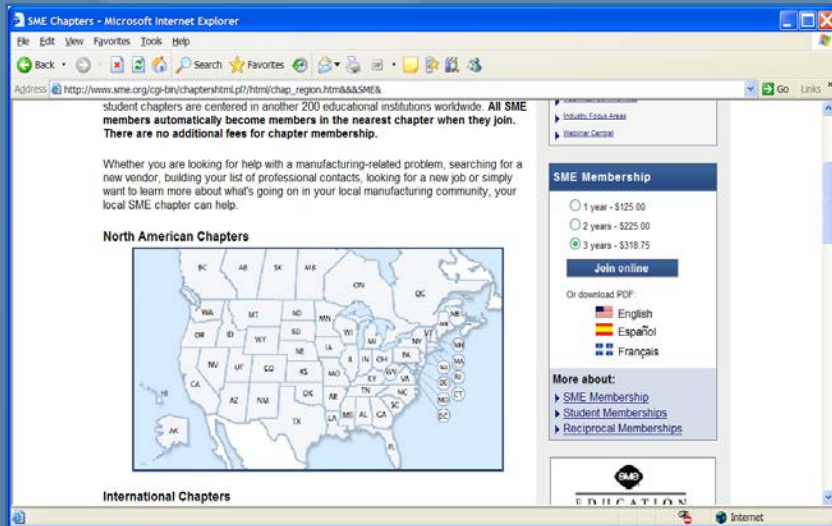


*Making the future. Together.™*

# LOCAL CHAPTERS

Get to know manufacturing professionals in your own backyard

- Social and professional networking
- Plant tours
- Technical presentations and training
- Youth and family programs
- Community involvement



- 168 Senior Chapters
- 165 Student Chapters
- 16 International Chapters

# TECHNICAL COMMUNITY NETWORK

A collaboration platform for PEOPLE, PROCESSES and IDEAS, designed to provide you with the most current information in your specialized area of interest within manufacturing

[sme.org/tcn](http://sme.org/tcn)

- Virtual and face-to-face meetings
- Producing technical content for SME programs and events
- Connect with peers and technical experts around the world

**Automated Mfg  
& Assembly**



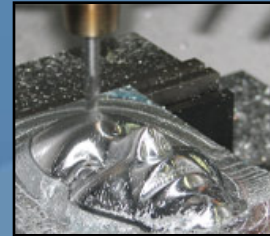
**Forming &  
Fabricating**



**Industrial  
Lasers**



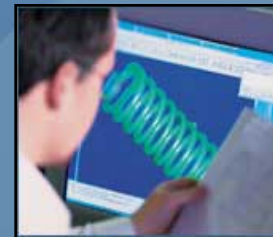
**Machining &  
Material  
Removal**



**Mfg Education  
& Research**



**Plastics,  
Composites &  
Coating**



**Product &  
Process Design  
and Management**



**Rapid  
Technologies &  
Additive Mfg**

# Virtual Connection Points



The screenshot shows the SME website homepage. At the top is the SME logo and a navigation bar with links: HOME, MY PROFILE, COMMUNITIES, DIRECTORY, EVENTS, BLOGS, MEMBER BENEFITS, HELP/FAQS, and SME.ORG. A search bar is also present. Below the navigation bar is a large banner for "smeSPEAKS" with the tagline "Revolutionary Knowledge Edge" and the date "August 2013". The banner includes a sidebar with "REDISCOVER SME", "STRATEGIC DIRECTION", and "SME SPEAKS - AUGUST". Below the banner are three main sections: "MEET" (Upcoming Events), "KNOW" (Latest SME News), and "GROW" (Tweets and Recent Blogs). The "MEET" section lists events like "BD Tour & Lunch", "Lean Collaborative Summit", "EAA Composite Fabrication Workshop", "SME Chapter 39 Summer Picnic", and "Open House". The "KNOW" section lists news items like "WESTEC 2013 Returns to California Amidst Promising Manufacturing Climate" and "Skills USA National Gold Medalist Follows Unconventional Path Toward Rewarding Future Career in Manufacturing". The "GROW" section features a tweet from @EdgeFactorShow and a recent blog post titled "New Age of Robotics".



MillTurn Calc App

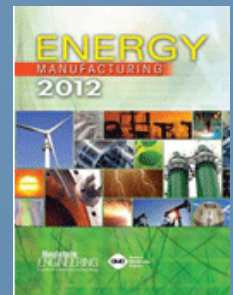
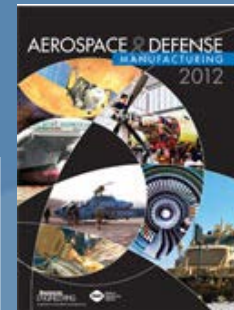




# EVERYTHING YOU NEED TO ... KNOW

## Manufacturing<sup>®</sup> Media ENGINEERING

- Manufacturing Content Channels – 22 channels of technology-specific content!!
- **NEW! Mobile App** for mobile device or iPad — **available through iTunes.**
- Free subscription to the industry-leading monthly publication, *Manufacturing Engineering*<sup>®</sup> magazine and its archived articles – a \$120 value.
- A copy of each new Manufacturing Yearbook, such as *Medical Manufacturing*, *Energy Manufacturing*, *Aerospace & Defense* and *Motorized Vehicle Manufacturing* – a \$25 value.
- The Digital Edition of *Manufacturing Engineering*<sup>®</sup> is an enhanced interactive magazine that replaces the online text-based version.
- SEARCH & BOOKMARK pages of the magazine on your computer desktop.
- CONNECT to the sources you're most interested in.



# WEBINARS

Welcome to SME's  
WEBINAR CENTRAL



***Webinars are live presentations, given by a technical leader, that you can take part in from your desk or conference room***

- Technology – specific webinars
- Participate from your desk or conference room
- All that is required is a phone and Internet connection
- Webinars are archived for future viewing by members
- A great way to distribute knowledge

[sme.org/webinars](http://sme.org/webinars)

# EVENTS & CONFERENCES

## SME Events



## SME EVENTS

Please take a copy of the  
SME Events schedule

Also available online at:  
[sme.org/events](http://sme.org/events)



# INDUSTRY INITIATIVES

- Find out what people in the SME Industry Focus Areas are doing to connect with your peers and colleagues
- Address crucial industry topics (i.e. Lean transformation, advanced materials and processes, and much more ... ).
- Connect with key manufacturers, suppliers, industry groups and educators.
- Collaborate with technical experts, process and equipment suppliers, and other resources.
- Focus on creating technological advances and success within industries.
- Develop new learning opportunities.
- Dynamic events, strategic alliances and informative publications.



Aerospace  
& Defense



Energy



Motorized Vehicles



Medical



Workforce  
Development

# Online Publications and e-Newsletters



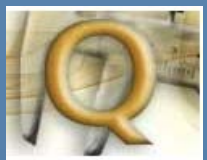
AeroDef  
Manufacturing



Energy  
Manufacturing



Lean  
Directions



Quality in  
Manufacturing



SME Member  
Newsletter



Tech Papers



SME Speaks



From the Desk of...(from SME Volunteer Leaders)



# TECHNICAL QUARTERLIES

**COMPOSITES**  
IN MANUFACTURING

THE **FINISHING** LINE<sup>®</sup>

**PLASTICS**  
INSIGHTS

**ROBOTICS**  
TODAY<sup>®</sup>

**ELECTRONICS**  
MANUFACTURING ENGINEERING

**MACHINING**  
TECHNOLOGY

**RAPID**  
**PROTOTYPING**

**VISION**

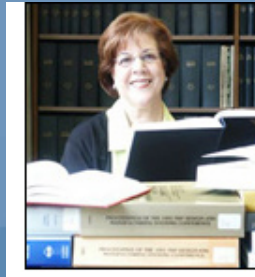
SME's *electronically archived* technical quarterlies

- Subject matter of interest to all manufacturing and technology practitioners
- All from a technical perspective
- Each issue includes brief articles, product announcements and event listings
- A \$400 annual value

# Research



North American Manufacturing  
Research Institute of the  
Society of Manufacturing Engineers



***SME "Ask the Librarian"  
service is a \$40,000 research  
database that is always at  
your fingertips - included  
FREE with membership!***

***Nonmembers have access  
to the Librarian services  
for a cost of \$50 per  
question asked.***

Connect to advances in  
fundamental and emerging  
technologies in material  
removal, material forming,  
and areas in manufacturing  
modeling, simulation,  
monitoring and control  
systems.

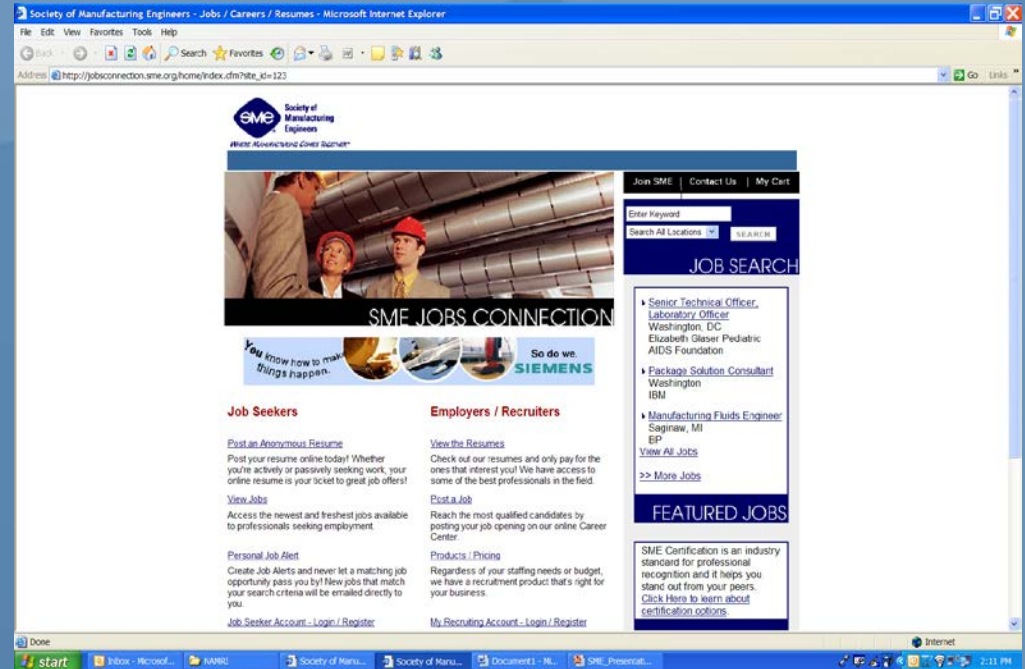
- ▶ Associations
- ▶ Books
- ▶ Calculation & Conversion Tools
- ▶ Dictionaries, Encyclopedias, Almanacs
- ▶ Directories
- ▶ Industry Standards and Specifications
- ▶ Linda Hall Library
- ▶ Manufacturing & Engineering Resources
- ▶ Market Research
- ▶ Salary Surveys
- ▶ Software
- ▶ Statistics
- ▶ Government
- ▶ National Technical Information Services



*Making the future. Together.™*

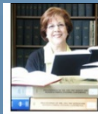
# JOBS CONNECTION

- ❖ Employers search for highly qualified manufacturing professionals
- ❖ Job seekers post anonymous resumes
- ❖ SME members float to the top, especially those who are certified



## ONLINE CAREER TOOLS

- One-on-One Career Coaching
- Ask the Career Expert
- Links, Articles, and Resources



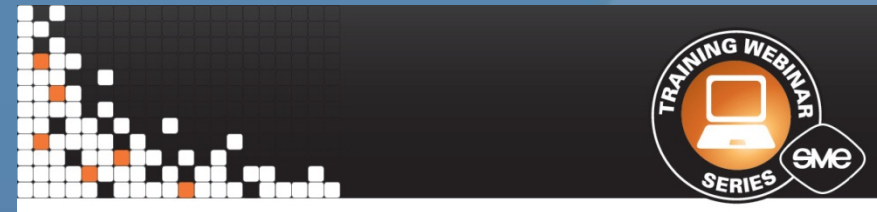
*Couple Jobs Connection with “Ask the Librarian” for a winning combination.*



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# EVERYTHING YOU NEED TO ... GROW



# TOOLINGU

www.toolingu.com

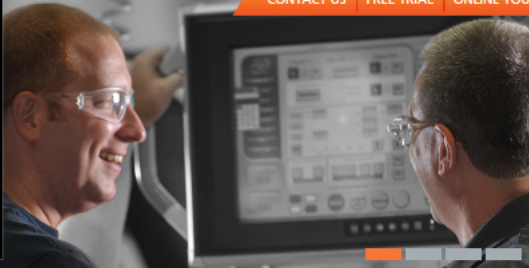


FIRST-TIME REGISTRATIONCONTACT USTECHNICAL SUPPORTADMIN LOGINSTUDENT LOGIN

PRODUCTSINDUSTRIESSERVICES & SUPPORTCOMMUNITYCOMPANY

CONTACT USFREE TRIALONLINE TOUR

TRAIN FOR  
TOMORROW.  
TRAIN FOR  
RESULTS.




### Manufacturing Training Solutions Made Easy

SMALL BUSINESSES

LARGE BUSINESSES

EDUCATORS

INDIVIDUALS



#### The Best Support. The Most Comprehensive Solution.

No matter what state your current training program is in, we can help. From instructional audits, to competency models, to position descriptions, to training plan designs, we help you get your training on track. Even better—you get access to the same industry-leading training used by Fortune 500 manufacturers.

[Check out our various services.](#)

### YOUR TRAINING SOLUTION


Every day, thousands of individuals use Tooling U-SME training to enhance their knowledge and expertise. We've worked with more than 5,000 organizations to train roughly 210,000 people.

- More than 50% of Fortune 500 manufacturing companies are Tooling U-SME customers
- Over 500 community colleges, high schools and middle schools are Tooling U-SME customers
- Documented average 20% increase in knowledge (pre-test to post-test)

### STANDARDS & CERTIFICATIONS

- NIMS
- SME
- MSSC
- AWS

### ONLINE TOUR



### Tooling U-SME News

Ford: Vehicle demand driving job growth, seeking qualified applicants  
Tooling U-SME to host tuXperience Conference

SkillsUSA National Gold Medalist Follows Unconventional Path Toward Rewarding Future Career

SME Launches Revolutionary Learning Pathway to Drive Manufacturing New Talent

### Online and Instructor-Led Catalog

Automation & Assembly Training  
Design & Engineering Training  
Industrial Maintenance Training  
Lean Training  
Management Training  
Materials Training  
Process Technologies Training

sme  
Making the future. Together.™

# PROFESSIONAL CERTIFICATIONS

*Earned by more than 36,000 people!*

**Members  
Save \$\$\$  
Hundreds  
of Dollars  
in  
Discounts**

[sme.org/  
certification](http://sme.org/certification)



**Assess your manufacturing knowledge.**  
Earn your CMfgT, CMfgE certification today!

**Engineering Management Certification  
Fundamentals**

**Engineering Management Certification  
Professional**

**Certified Manufacturing Technologist (CMfgT)**

**Certified Manufacturing Engineer (CMfgE)**

**Six Sigma Certification**

**Lean Certification (Bronze, Silver, Gold)**



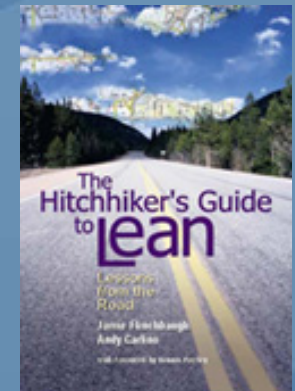
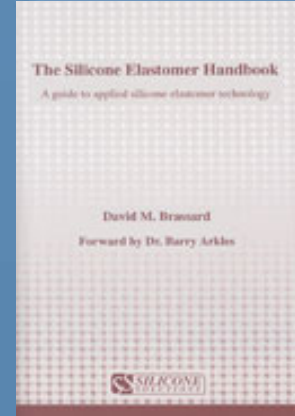
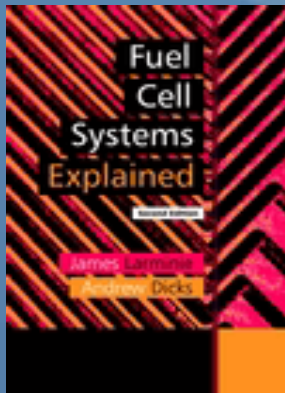
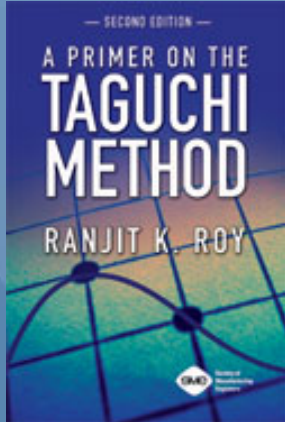
**sme**

*Making the future. Together.™*



# MANUFACTURING KNOWLEDGE BASE

- ▶ Discounts on an extensive line of publications and videos
- ▶ Fundamentals to leading-edge emerging technologies





At the core of the new Manufacturing Knowledge Base Wiki is the nine-volume, encyclopedic-printed reference source, SME's "Tool & Manufacturing Engineers' Handbook."

The **TMEH** provides comprehensive information on the most important manufacturing topics, featuring the combined knowledge of thousands of expert contributors and reviewers. And now that we've gone digital, you can be one of them!

SME members have the ability to create, edit and update content with an easy-to-use wiki format. This is your chance to contribute to what's important to you and your industry!

See more at: [www.sme.org/mfgknowledgebase](http://www.sme.org/mfgknowledgebase)

# AWARDS

## Generation Now

It's your time to reap the rewards of your lifelong work on behalf of others. **You've been called the Silent Generation, Baby Boomers, the Me Generation and, more recently, Generation X.** Or should we call you Generation Wow because you:

- Develop processes and make discoveries that help **make our lives cleaner, brighter, faster, and above all, better**
- **Give manufacturing its own brand of cool** with ever-advancing technologies like rapid, nanomanufacturing and robotics
- **Hold patents on limitless imagination** and innovations like no other
- **Prepare the next generation of inventive minds**
- **Inspire** others
- Do your part to develop jobs and **help keep global economies running**
- **Think in hi-def**
- **Research impossibilities and turn them into realities**

So shouldn't there be awards for all of the above; for what you have yet to do, discover or develop?

The Society of Manufacturing Engineers has a number of awards to honor your efforts and contributions throughout your career.

- International Honors Awards (7)
- College of Fellows (*membership required*)
- Honorary Membership
- Outstanding Young Manufacturing Engineer Award
- Award of Merit (*chapter award*)
- NAMRI/SME S.M. Wu Research Implementation Award
- Total Excellence in Electronics Manufacturing Award
- FFC Technical Paper Excellence Award
- Rapid Technologies & Additive Manufacturing Awards (2)
- J.H. "Jud" Hall Composites Manufacturing Award
- Presidents Award (*chapter award*)



[sme.org/awards](http://sme.org/awards)



# SME Education Foundation

## YOUTH AWARENESS OF MANUFACTURING

- SME provides information, tools and opportunities for students to learn about manufacturing and the exciting, satisfying, lucrative career opportunities it offers
- The SME Education Foundation impacts more than 15,000 K-12 students each year



# SME Education Foundation Scholarships



Since 1998, the SME Education Foundation has provided more than \$6.5 million dollars in financial aid through its various scholarship programs.

The Foundation awards scholarships to graduating high school seniors, current undergraduates and master's or doctoral degree students pursuing degrees in manufacturing and related fields at two-year and four-year colleges. technology. [smeef.org](http://smeef.org)

[smeef.org](http://smeef.org)

# Youth Programs

## CareerMe.com

This exciting and innovative new resource, designed by the National Center for Manufacturing Education in partnership with the SME Education Foundation (SME-EF), is designed to encourage and provide young people in grades 11-14 with information they need on careers in advanced manufacturing.

## CIM

Through the CIM program, the Foundation introduces high school students to exciting careers in manufacturing while engaging our industry partners and local SME chapter members.

## PRIME (Partnership Response in Manufacturing Education)

*The SME Education Foundation is committed to changing the future of manufacturing education and addressing the shortage of manufacturing and technical talent in the United States. Through PRIME, it is creating strong partnerships between organizations, businesses, and exemplary schools to provide a comprehensive community-based approach to manufacturing education. For details, go to:*

***[www.smeef.org/prime](http://www.smeef.org/prime)***

## ManufacturingIsCool.com

This award-winning, interactive website challenges and engages students in basic engineering and science principles, and provides interesting and useful educational resources for teachers. This fun and information-rich website was recently "re-engineered" (updated) and marketed around the country. The Foundation has received positive feedback from teachers, parents and students about its usefulness.

## National Robotics Challenge

The SME-Education Foundation (SME-EF) is proud to support the National Robotics Challenge where students demonstrate their engineering ingenuity and creativity encouraging them to pursue rewarding engineering careers.

## Gateway Camps

A week long day camp for 6th - 8th graders, Gateway Academy is a project-based, hands-on curriculum designed by Project Lead The Way® to introduce middle school students to the fundamentals of science, technology, engineering and math.



*Making the future. Together.™*

# IT'S YOUR TIME ~ IT'S YOUR SME

## *It's time to get involved ...*

- ✓ In Your Local SME Chapter
- ✓ In Your SME Technical Community
- ✓ In Your SME Education Foundation
- ✓ In Your Manufacturing Community

**The future of MANUFACTURING  
depends on YOU and YOUR SME**

# Getting Involved in YOUR SME

- Learn from people in other industries; cross pollination can help solve problems
- Share your personal experiences and mentor others
- Provides alternate networking for employees within a common company, regardless of current level - through technical meetings and local plant tours
- Get firsthand exposure to new technology, processes and new career opportunities
- Through SME, your company reaps solutions and exposure for little or no cost
- Opportunity to gain enhanced professional competitiveness through your affiliation with SME
- Come in contact with people who can provide solutions
- Learn best practices from other people, chapters or companies
- Provides a safe environment to develop your business and personal skills

**Leadership skills**

**Public speaking**

**Finance**

**Project and Event Planning**

**Fundraising**

**Marketing**

**Human Resources**

**Sales**



*Making the future. Together.™*



# SME is getting people to work together

EVERYONE YOU NEED TO ...

MEET

EVERYTHING YOU NEED TO ...

KNOW

EVERYTHING YOU NEED TO ...

GROW

Student Membership \$ 20



***SME*** connects all those who are passionate about making things that improve our world.

As a nonprofit organization, SME has served practitioners, companies, educators, government and communities across the manufacturing spectrum for more than 80 years.

*Through its strategic areas of events, media, membership, training and development, and the SME Education Foundation, SME shares knowledge to advance manufacturing.*

*At SME, we are making the future.  
Together.*

# Questions?

*Please contact:*

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**Natalie Lowell CMfgT**  
**SME Member Engagement Manager**  
**nlowell@sme.org 313-425-3129**

*Thank you for your interest in SME!*  
*[sme.org/join](http://sme.org/join)* *[i.sme.org](http://i.sme.org)*

# OUR HISTORY

## THEN ...



- Founded in 1932 with 33 members
- Formed by a group of tool engineers and master mechanics
- Mission: to collaborate on how to build the automobile
- Originally named the Society of Tool Engineers
- In 1933 renamed the American Society of Tool Engineers
- Became the Society of Manufacturing Engineers in 1969
- In June 2013 became known as SME

## NOW ...

- SME is the world's leading professional society supporting manufacturing education
- SME members promote an increased awareness of manufacturing engineering
- Keeps manufacturing professionals up to date on leading trends and technologies
- Influences more than half a million manufacturing practitioners and executives annually
- Members worldwide
- Supported by a network of hundreds of technical communities and chapters worldwide
- Members hail from diverse manufacturing industries



## SME Members:

SME's new Manufacturing Knowledge Base Wiki is another way your SME membership helps you to **MEET | KNOW | GROW !**

- ▣ Participate in content development that is relevant to you, your job and your industry
- ▣ Connect online with other content experts to share, discuss and contribute knowledge
- ▣ Pass along your expertise to the next generation to build a stronger workforce
- ▣ Gain recognition as an expert contributor and open doors to publishing and career advancement
- ▣ See more at: [www.sme.org/mfgknowledgebase/](http://www.sme.org/mfgknowledgebase/)



## Nonmembers:

Participation in the Manufacturing Knowledge Base Wiki is currently exclusively for SME members only.

- Discover how you can become an agent of change for the new Manufacturing Knowledge Base Wiki!
- Become a member and begin participating at: [www.sme.org/join](http://www.sme.org/join)
- See more about the Wiki at: [www.sme.org/mfgknowledgebase](http://www.sme.org/mfgknowledgebase)