FALL 2014

Elastomer & Plastics Technology
ELASTOMER & PLASTICS TECHNOLOGY

Quality Courses. Qualified Instructors.
Maximize productivity, efficiency and innovation throughout your organization. You’ll use your new skills to make an immediate impact at your job. How do we know? Because our instructors use them, too! SCE instructors are real-life engineers seasoned with real-world experience in the field they teach.

Terry Chapin has spent 30 years in the rubber industry, and is currently a senior materials engineer at Delphi, working primarily in the area of silicones, elastomer parts and foam products development.

John Dick has authored more than 65 journal and magazine publications and four books on rubber technology. He’s a long-time U.S. delegate to the International Standards Organization (ISO).

Rick Finnie, owner of owner of M. R. Mold & Engineering, is known for his expertise and experience in high quality liquid silicone rubber (LSR), gum stock silicone, plastic injection molds.

Juergen Giesow has more than 25 years of experience in the plastic industry, has presented dozens of papers and is the regional manager for ARBURG.

The Madison Group is a recognized global leader providing technical expertise, innovative technology and economic solutions that help drive product development to the plastics industry since 1993.

Bob Pelletier has worked in the LSR & RTV industry for over 20 years and is involved with machine programming and development, creating service manuals and product literature.

Nick Schott earned his Ph.D. in chemical engineering, and has been teaching, researching and publishing work at the University of Massachusetts for over 30 years.

James Stevenson has more than 35 years of experience in processing rubber and plastics. Since earning his M.S. and Ph.D. from UW-Madison, he has published many works and received more than 20 patents.

Peter Surette, Sr. has held various positions in the rubber industry throughout his career. He’s been an active member of ASTM International, and he established his own consulting business in 2002.

John Timmerman has over 25 years in the processing of silicone rubber in both high consistency and liquid forms and is currently vice president at the high volume LSR molder, Starlim North America.

Mel Toub, president of MT Consultants, has years of experience developing silicone elastomers for the automotive, aerospace, healthcare, and wire & cable industries.

John Vosmeier has worked as a design manager, senior tooling engineer and senior mold designer, and is currently the tooling manager for a consumer goods company.

Van Walworth is the president of Research & Design Specialties, Inc. in the greater Nashville area. He is a consultant, idea guy and “rubber whisperer,” with more than 20 years of instructional experience.

 Earn your Elastomer Technology Certificate or Plastics Technology Certificate by attending nine or more days of related courses within three years. Visit sce-eng.uwm.edu to get started today!

All programs are held at the School of Continuing Education in Milwaukee, Wisconsin, unless otherwise noted. For full course descriptions please visit sce-eng.uwm.edu or contact:

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Molding of Rubber and Design of Rubber Molds

Learn the fundamentals of molding rubber mechanical goods and designing their rubber molds, with no reference to the molding of tires. Review applicable molding methods with emphasis on compression, transfer and injection processes. Bring drawings or troublesome parts to address real-world issues during class.

Course Outline:
- Rubber Material Overview
- Overview of Molds and Molding Processes
- Overview of Presses and Molding Equipment
- Basic Mold Construction
- Mold Steel and Finishing
- Cavity Inserts, Cores and Core-Bars
- Gates, Venting and Vacuum
- Runner Layouts and Cross-Sections
- Runner Design Techniques
- Flashless and Wasteless Molding Techniques
- Special Prototype Mold Designs
- Rubber to Metal Bonding and/or Over-Molding
- Mold Operation Techniques
- Tolerances for Parts and Molds
- Design for Manufacturability (DFM)
- Troubleshooting
- Workshop sessions with Q&A

Learning Outcomes:
- Gain an integrated perspective on rubber molding and design of rubber molds
- Understand current principles and techniques in the design of molds and molded part design
- Explore useful design information – valuable for beginners and seasoned practitioners

Thu.-Fri., Apr. 15-17, 2015, 8am-4:30pm
(Ends at 2pm on Day 3)
Instructors: Terry Chapin, Van Walworth
Fee: $1290
Early Bird: $1090 (register by Feb. 15, 2015)
CEUs: 1.8/PDHs: 18
Program No. 4830-7518

Rubber Compounding and Mixing for Performance

Start with the basics of formulating, the key processability characteristics and the most common factory problems and causes, then go further in-depth in this three-day, intensive overview of rubber compounding and mixing.

Course Outline:
- Rubber Testing
- General Purpose Elastomers
- Specialty Elastomers
- Mixing
- Filler and Oil Systems
- Rubber Chemicals
- Compounding for Dynamic Performance Properties
- Introduction to Factory Problems
- Nature and Techniques for Solving Problems in Rubber Compounding and Processing
- Case Studies of Rubber Compounding and Processing Problems

Learning Outcomes:
- Know the five categories of rubber processability tests
- Understand the differences between general purpose and specialty elastomers, and how they affect compounding and mixing
- Review methodologies for solving factory problems

Wed.-Fri., Sept. 24-26, 8am-4:30pm
Instructors: John Dick, Peter Surette, Sr.
Fee: $1290
Early Bird: $1090 (register by July 24)
CEUs: 1.8/PDHs: 18
Program No. 4830-6694
Rubber Extrusion Technology

Learn applicable basic information on all aspects of the rubber extrusion process. Build a knowledge base that encompasses products ranging from intricate profile extrusions to tires, using compositions ranging from a single thermoplastic elastomer to multiple dense and cellular compounds coextruded with carriers and reinforcements.

Course Outline:
• Elastomer Properties
• Laboratory Tests for Extrudability
• Compound Ingredients
• Processing and Compounding
• Pumping Equipment
• Shaping Equipment
• Downstream Equipment
• Instrumentation
• Operations
• Advanced Technologies
• Troubleshooting

Learning Outcomes:
• Understand compound ingredients, characterization and processing
• Become familiar with equipment for pumping, shaping, curing and monitoring
• Learn various methods related to process variation and control

Wed.-Fri., Apr.22-24, 2015, 8am-4:30pm
Instructors: John Dick, James Stevenson
Fee: $1390
Early Bird: $1290 (register by Feb. 22, 2015)
CEUs: 2.0/PDHs: 20
Program No. 4830-7284

Silicone Elastomers Technology and Fabrication

Receive a comprehensive overview of silicone elastomers, including basic silicone chemistry, types of silicone elastomers, manufacturing processes, fabrication techniques, problem-solving and application areas. With an emphasis on liquid injection molding, learn from a panel of experts in the silicones field, and discuss specific projects of interest.

Course Outline:
• Silicone Elastomer Technology
• Liquid Silicone Rubber (LSR/LIM)
• Tooling Design and Construction
• Adhesion and Bonding of Silicone Rubber
• Class Project

Learning Outcomes:
• Visit M.R. Mold & Engineering Corp. to experience the production of an actual liquid silicone rubber part
• Observe pump design and operation, machine setup and operation, flow analysis, and more
• Understand material selection, dispensing methods, injection molding process, tool design and bonding alternatives

Mon.-Thu., Feb. 16-19, 8am-4:30pm
Location: Embassy Suites Anaheim/Orange, Orange, CA
Instructors: Rick Finnie, Juergen Giesow, Bob Pelletier, John Timmerman, Mel Toub
Fee: $1290
Early Bird: $1090 (register by Dec. 16)
CEUs: 2.4/PDHs: 24
Program No. 4830-7478

Save $100 or More!

Enroll two months before the start of most courses to receive Early Bird Discounts.
Designing Plastic Parts for the Injection Molding Process

Prerequisites: Some knowledge of plastic materials, injection molding and engineering principles is useful, although the basics are introduced.

Get a fundamental overview of plastic part design for the process of injection molding – ideal for engineers and designers who are accustomed to working with metals, but faced with metal to plastic concerns. Examine plastic materials, behavior and selection, engineering design, manufacturing considerations and assembly methods.

Course Outline:
• Introduction to Plastic Materials
• Injection Molding Equipment
• Injection Molding Process
• Review of Injection Molds
• Mechanical Behavior of Plastic Materials
• Approaching Plastic Product Development

Learning Outcomes:
• Learn how to select an appropriate plastic material formulation
• Discover how to work within the manufacturing limitations associated with the injection molding process
• Understand how to approach plastic product development and establish end use requirements

Mon.-Tue., Nov. 3-4, 8am-4:30pm
Instructor: Nick Schott
Fee: $990
Early Bird: $890 (register by Sept. 4)
CEUs: 1.4/PDHs: 14
Program No. 4830-7463

Plastic Injection Mold Design Basics

Get a practical and comprehensive look at injection mold design and learn to contribute to the overall success of projects. Receive a unique blend of very detailed mold design concepts set forth in the context of the whole design process, and on the final day, participate in that process.

Course Outline:
• The anatomy of a mold
• The molding process
• Plastic resin fundamentals
• Shrink
• Plastic part design fundamentals
• Sprue, runner and gate
• Ejection
• Basic mold inserting
• Slides and lifters
• Cavity Layout
• Cooling and venting
• Mold steel
• Plating and Polishing
• Mold design from a project perspective

Learning Outcomes:
• Understand mold design concepts
• Avoid costly mistakes
• Specify and evaluate your purchases of molds

Mon.-Wed., Oct. 13-15, 8am-4:30pm
Instructor: John Vosmeier
Fee: $1290
Early Bird: $1190 (register by Aug. 13)
CEUs: 2.0/PDHs: 20
Program No. 4830-7357
Plastic Injection Mold Design Advanced

Prerequisites: Completion of Plastic Injection Mold Design Basics or a solid knowledge of the subject matter.

Take your understanding of the inner workings of injection molds to the next level. With a focus on cost savings throughout, work on “mini-projects” at each important juncture in order to master advanced concepts.

Course Outline:
- Molding Surface Tolerances
- Mold Strength and Performance
- Mold Alignment and Interlocking
- Advanced Parting Line and Shut-off Development
- Advanced Slide and Lifter Design
- Advanced Cavity and Core Inserting
- 3D Modeling and Mold Design
- Mold Monitoring

Learning Outcomes:
- Understand advanced parting line, shut-off development, advanced slide and lifter design
- Learn to do advanced cavity and core inserting
- Analyze your current issues regarding the subject matter

Thu.-Fri., Oct. 16-17, 8am-4:30pm
Instructor: John Vosmeier
Fee: $1090
Early Bird: $990 (register by Aug. 16)
CEUs: 1.4/PDHs: 14
Program No. 4830-7358

Plastic Part Failure: Analysis, Design & Prevention

Dive into a broad range of topics essential to understanding and preventing plastic failure. The most efficient and effective approach to plastic component failure is performing a systematic failure analysis following scientific method. Someone once said, “if you don’t know how something broke, you can’t fix it,” highlighting the importance of a thorough understanding of how and why a product has failed.

Course Outline:
- Overview of Plastics
- Composition and Properties
- Plastic Part Failure
- Failure Correction and Prevention
- Failure Mechanisms
- The Roles of Multiple Factor Concurrency and Statistical Distribution in Plastic Part Failure
- Problem Solving / Investigation Techniques – FA and RCA
- Failure Analysis Test Methods
- Case Studies

Learning Outcomes:
- Learn the five factors affecting plastic part performance
- Explore the process of conducting a failure investigation
- Understand the importance of ductile-to-brittle transitions and their role in plastic component failure
- Learn the approaches to more quickly respond to and resolve plastic component failure

Mon.-Wed., Oct. 13-15, 8am-4:30pm
Instructor: The Madison Group
Fee: $1090
Early Bird: $990 (register by Aug. 13)
CEUs: 2 / PDHs: 20
Program No. 4830-6889
Register:
sce-registration.uwm.edu
800-222-3623 | 414-227-3200
Mon.-Fri., 8am-5pm CST

Location:
Programs will be held at the UWM School of Continuing Education, 161 W. Wisconsin Avenue. SCE is conveniently located in downtown Milwaukee.

For the latest information on getting to and from SCE, visit sce-directions.uwm.edu. The webpage includes access to printable color PDFs of current maps, information about parking, public transportation information and other details relevant to our location. Visit sce-hotels.uwm.edu for an abundance of nearby lodging and entertainment options.

Program Cancellations/Refunds*
A full refund is issued to program participants if the School of Continuing Education cancels a program for any reason. Participant withdrawals made at least two weeks (14 days) prior to the start of a program can receive a 100% refund. When a participant withdraws less than two weeks prior to the program start, participants may have their fees transferred one time to any currently available program, otherwise participants will receive a refund minus a 20% administrative fee. For programs with a fee of $35 or less, no refund will be given, if a participant withdraws within two weeks of the start date. Once a program has begun, refunds are no longer issued.

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