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Paul Bonenberger, author of *The First Snap-Fit Handbook*, worked as an expert in mechanical attachments at a major North American engineering and manufacturing company for over 30 years.

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 M. R. Mold & Engineering, is known for his expertise and experience in high quality liquid silicone rubber (LSR), gum stock silicone and 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 and 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.

**All programs are held at the School of Continuing Education
in Milwaukee, Wisconsin, unless otherwise noted.
Visit uwm.edu/sce-eng for full course descriptions.**



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ELASTOMER TECHNOLOGY

uwm.edu/sce-rubber

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/lir)
- 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

Tue.-Fri. Feb. 2-5, 2016, 8am-4:30pm

Location: Embassy Suites Anaheim/Orange, Orange, CA

Instructors: Rick Finnie, Juergen Giesow, Bob Pelletier, John Timmerman, Mel Toub
Early Bird: \$1090 (Register by Dec. 2)

Fee: \$1290

CEUs: 2.4/PDHs: 24

Program No. 4830-8380

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:

- Basic mold construction
- Mold steel and finishing
- Cavity inserts, cores and core-bars
- Gates, venting and vacuum
- Runner layouts and cross-sections
- Runner design, flashless molding 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)

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

Mon.-Wed., Apr. 18-20, 8am-4:30pm

Instructors: Terry L. Chapin, Van T. Walworth
Early Bird: \$1190 (Register by Feb. 18)

Fee: \$1290

CEUs: 1.8/PDHs: 18

Program No. 4830-8833



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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 and 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. 27-29, 8am-4:30pm

Instructors: John Dick, James Stevenson

Early Bird: \$1290 (Register by Feb. 27)

Fee: \$1390

CEUs: 2.0/PDHs: 20

Program No. 4830-8659

Essentials of Silicone Elastomers

Get a detailed description of silicone elastomers, emphasizing their chemistry, physical and rheological properties, curing process, and associated test methods, both physical and analytical.

Course Outline:

- Silicone nomenclature, features and benefits
- Typical applications
- Silicone polymers and compounds
- Chemical structure
- Molecular weight/viscosity
- Static and dynamic properties
- Viscoelasticity and flow
- Analytical test methods
- Cure process/measurement
- Property matrix
- Test reproducibility
- QC laboratory testing
- Experimental design

Learning Outcomes:

- Understand silicone elastomer technology – applications, features, benefits and all aspects of the manufacturing process
- Be familiar with dynamic and static properties, curing process and chemical structure
- Examine various analytical testing methods with specifications, property matrix and experimental design considerations

Mon.-Tue., May 16-17, 8am-4:30pm

Instructors: Mel Toub, Mary Krencski

Early Bird: \$790 (Register by Mar. 16)

Fee: \$890

CEUs: 1.4/PDHs: 14

Program No. 4830-8835



PLASTICS TECHNOLOGY

uwm.edu/sce-plastics

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:

- Mold types and basic mold construction
- Common components and their function
- The molding press
- Plastic resin fundamentals
- Plastic product design fundamentals
- Sprue, runner and gate
- Ejection and basic mold inserting
- Slides and lifters
- Cavity layout
- Cooling, 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., Apr. 25-27, 8am-4:30pm
Instructor: John Vosmeier
Early Bird: \$1190 (Register by Feb. 25)
Fee: \$1290
CEUs: 2/PDHs: 20
Program No. 4830-8271

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., Apr. 28-29, 8am-4:30pm
Instructor: John Vosmeier
Early Bird: \$990 (Register by Feb. 28)
Fee: \$1090
CEUs: 1.4/PDHs: 14
Program No. 4830-8269

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**Enroll two months before the start of most courses
to receive Early Bird Discounts.**

“

Of the classes I've taken, Simply Snap-Fits is the best one yet. It will be an excellent resource in my workplace!

-- Jana Hermanson

”

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:

- Review of injection molding equipment and processes
- 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., May 16-17, 8am-4:30pm

Instructor: Nick Schott

Early Bird: \$890 (Register by Mar. 16)

Fee: \$990

CEUs: 1.4/PDHs: 14

Program No. 4830-8253

Simply Snap-Fits: Developing World-Class Snap-Fit Attachments

Develop a deep understanding of snap-fit attachments and gain the knowledge to develop snap-fit applications optimized for reliability, manufacturing, assembly and customer usage. With real-life observations, sample parts and a copy of the instructor's book, *The First Snap-Fit Handbook*, you'll have the tools to master the snap-fit technology fundamentals.

Course Outline:

- Systematic approach to developing snap-fit applications
- Snap-fit attachment technology
- Satisfying diverse requirements
- Product assembly and reliability

Learning Outcomes:

- Understand how a snap-fit attachment functions as a complex system of features
- Recognize and avoid many common snap-fit mistakes
- Know the minimum design requirements for a successful snap-fit attachment

Mon.-Tue., Sept. 19-20, 8am-4:30pm

Instructor: Paul Bonenberger

Early Bird: \$890 (Register by July 19)

Fee: \$990

CEUs: 1.4/PDHs: 14

Program No. 4830-8936



GENERAL INFORMATION

Register:

uwm.edu/sce-registration
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, unless otherwise indicated.

For the latest information on getting to and from SCE, visit uwm.edu/sce-directions. 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 uwm.edu/sce-hotels 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. Once a program has begun, refunds are no longer issued.

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