

Lecturer

Dr. John Vlachopoulos started teaching at McMaster University after receiving his doctorate from Washington University, St. Louis, Mo., USA.

He served as department Chairman (1985-88) and he is currently Professor Emeritus of Chemical Engineering and Past Director of the Centre for Advanced Polymer Processing and Design (CAPPA-D). He was on sabbatical research leave at I.K.T. Stuttgart, Germany (1975) and CEMEF, Ecole des Mines de Paris, Sophia Antipolis, France (1981-82, 1988-89).

He is the author of more than 300 publications on polymer processing, rheology and computer aided methods. Over the years he has served as consultant to several hundred corporations.

With his coworkers, he has developed the commercially available POLYCAD®, SPIRALCAD, CALENDERCAD, FLATCAD, PROFILECAD, EXTRUCAD (renamed NEXTRUCAD), LAYERCAD, T-FORMCAD, B-FILMCAD, RHEO-MWD, XTRU-XPART and CALCUTRUDE software packages, which have been licensed to more than 500 corporations in 30 countries through the company that he founded, POLYDYNAMICS, INC.

He has lectured in 43 countries around the world in seven languages (mostly in English, but also in French, German, Spanish, Greek, a few hours in Italian and two hours in Portuguese).

He received from the Society of Plastics Engineers (SPE) the 2001 Education Award at ANTEC in Dallas, and from the Extrusion Division of SPE the 2004 Distinguished Achievement Award at ANTEC in Chicago and the 2014 Bruce Maddock Award at ANTEC in Las Vegas.

He is also the recipient of the Stanley G. Mason Award of the Canadian Society of Rheology (2007) and Fellow of the Canadian Academy of Engineering (FCAE).

He was the President of the Polymer Processing Society (PPS) 2005-2007, and member of several other professional associations.

Prof. Vlachopoulos' research work and expertise includes applied rheology, computer simulation of several processes, extrusion instabilities and defects, calendaring, die design, coextrusion, injection molding, thermoforming, rotational molding, powder particle coalescence, film blowing, plastic wood composites (WPC) extrusion, rheology of bioplastics and nanocomposites.



Lecture Notes

Each participant will receive a copy of the annually updated book of lecture notes on POLYMER RHEOLOGY AND EXTRUSION.

This fact-filled book includes copies of the presentation slides, theory, detailed derivations of several important equations and numerous worked out problems.

It is highly recommended for follow-up reading either as a quick information sourcebook or for in-depth study. It is easy to follow with the mathematical level kept to a minimum.

Several key references are also given for persons wishing to continue upgrading their knowledge and understanding. It shows how to do simple calculations of shear rate, shear stress, pressure drop, temperature rise due to viscous dissipation, Rabinowitsch and Bagley corrections in capillary viscometry, rheology of composites, wall slip velocity, flow throughput in extruders and much more.

Whether you want practical problem solving information and troubleshooting tips or you want to understand the importance of recent developments, you will find this book indispensable.

History of the Intensive Short Course

Versions of the intensive short course on Polymer Rheology and Processing have been presented by Prof. J. Vlachopoulos in Canada, Greece, Sweden, Venezuela, Mexico, USA, Finland, Czechoslovakia, Belgium, Brazil, Australia, Japan, Germany, Italy, Luxembourg, Spain and Netherlands.

Over 2000 polymer professionals have attended the lectures and provided their suggestions for improvement of the course content and the presentation style.

The present international intensive short course will cover fundamentals, recent developments and will show how to use rheology to solve practical problems in the polymer industry.

For registration please visit <https://rmit.onestopsecure.com/OneStopWeb/POLYMERRHEOLOGY2016>

74th International
Intensive Short Course on

Polymer Rheology and Extrusion

A Problem Solving Approach

November 10-11, 2016
Rydges on Swanston,
Melbourne VIC Australia

Lecturer

John Vlachopoulos
McMaster University and
Polydynamics Inc. Canada

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Who Should Attend

Engineers, chemists, physicists, and managerial personnel involved with plastics extrusion, applied rheology, blow molding, mixing and compounding, reactive processing, production of synthetic polymers, recycling and process equipment design and manufacturing will find this course beneficial.

Engineers will gain an increased understanding of rheological behavior including the role of molecular structure and will learn some of the unique engineering problems associated with polymer extrusion.

Chemists will learn about fluid flow and heat transfer involving polymers and troubleshooting of extrusion equipment. Managers will obtain an overview of the technical problems associated with plastics extrusion.

Everyone will benefit from learning problem solving techniques based on rheological characterization and polymer flow considerations.

PROGRAM OUTLINE

THURSDAY NOVEMBER 10, 2016
REGISTRATION 8.00 - 9.00

Introduction to Rheology 9:00 - 12:30

- » Brief introduction to polymer basics.
- » Unusual rheological phenomena exhibited by polymer solutions and melts.
- » The importance of rheology in polymer processing.
- » Viscosity, melt flow index and melt strength, and their relation to molecular structure.
- » The role of temperature, pressure, additives and fillers.

Lunch 12:30 - 14:00

Advanced Rheological concepts and applications 14:00 - 17:00

- » Shear and normal stresses.
- » Viscoelasticity.
- » Stress relaxation.
- » Extensional viscosity.
- » G' and G'' measurement and significance in polymer characterization.
- » The role of rheology in mixing and blending.
- » Rheological modifications by blending certain polymers, such as LLDPE and LDPE.
- » Determination of MWD from rheological measurements.
- » Predicting processability from rheology.
- » Viscosity of suspensions.
- » Rheology of wood plastic composites (WPC).
- » Rheology of some nanocomposites
- » Problem solving using rheology.

Cocktails and Canapes 17.00 -19.00

FRIDAY, NOVEMBER 11, 2016
REGISTRATION 8.30 - 9.00

Melt Flow Through Dies, Extrudate Swell, Die Lip Build-up, Sharkskin and Melt Fracture 9:00 - 12:30

- » Unidirectional and multidimensional flows.
- » Pressure drop and frictional heating (viscous dissipation).
- » The mechanisms responsible for extrudate swell.
- » Die lip build-up (drool) causes and remedies.
- » Relation to molecular structure.
- » Causes for the onset of sharkskin and gross melt fracture.
- » The effects of adhesion and slip.
- » The role of additives and processing aids.

Lunch 12:30 - 14:00

Screw Extrusion and Troubleshooting 14:00 - 17:00

- » Principles of solids conveying, melting, mixing and melt pumping in single screw extrusion.
- » Simple formulas for calculation of Throughput, Power and Torque.
- » Screw design considerations and review of modern designs.
- » Conventional versus barrier screws.
- » Screws with mixing elements.
- » Dies for extrusion and coextrusion.
- » Surging, gels, screw and barrel wear, the role of moisture, interfacial instabilities, weldlines, MD Flow lines, and thickness non-uniformities.
- » Systematic fault diagnosis and troubleshooting.

For more information contact:

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