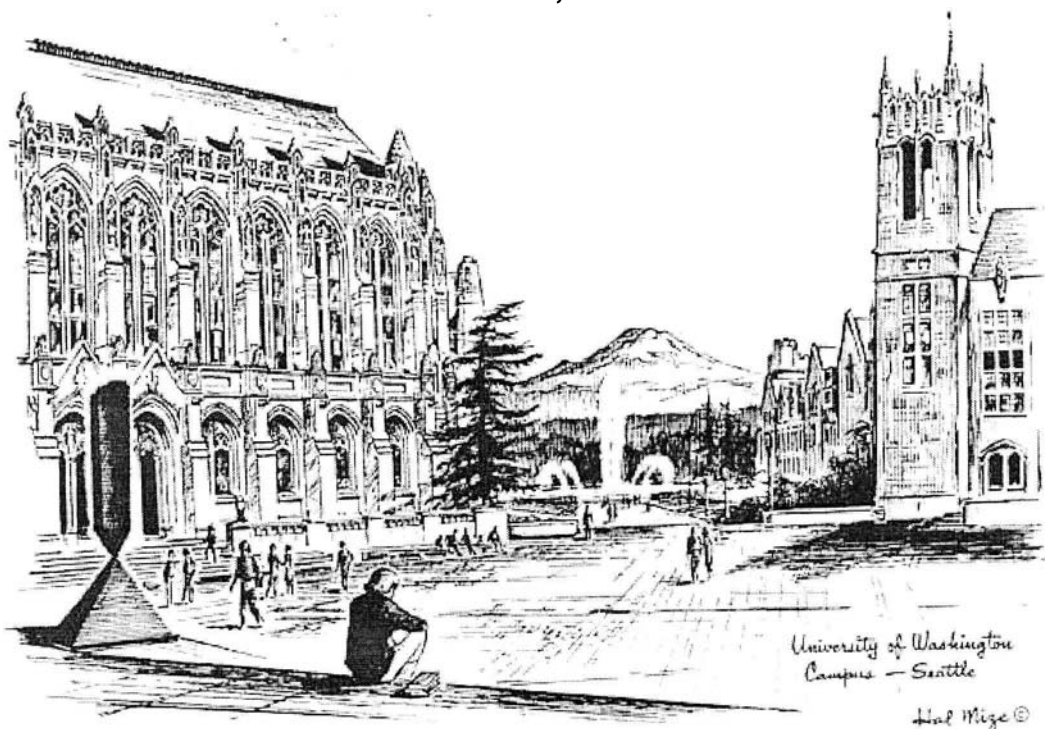


A SHORT COURSE IN...

Surfaces, Colloids and Nanoscience

August 20 -24, 2007

University of Washington
Seattle, WA



***Learn about Interfacial Phenomena
and the underpinnings of Nanotechnology***

Course fee: \$1575 (for registration before Aug. 13, 2007)

To register:

- Log onto: www.engr.washington.edu/epp/scs/, or
- Call: 1-866-791-1275 (toll free), or
- Send or fax in Registration Form below

Course information

You will benefit by attending this course if you are an..

Industrial researcher, engineer or technician dealing with surfactants, thin films, coatings, natural or synthetic fibers, adhesives, lubricants, wetting agents, foams, pigments, powders, drug delivery systems and other materials for which surface properties an important role.

How you will learn

The course consists of lectures in the mornings, which develop the fundamentals and trace their consequences into industrial practice, and laboratory demonstrations in the afternoons, which illustrate modern methods of investigation and characterization of surface and colloidal systems.

Faculty

Lectures will be presented by the course director, John Berg, Rehnberg Professor of Chemical Engineering at the University of Washington. Professor Berg has pursued a research program in surface and colloid science over the past 25 years, and has published over 180 research papers in the area. He has received a J. S. Guggenheim Fellowship at the Swiss Federal Institute of Technology, the University of Washington Outstanding Teaching Award, the Chemical Engineering Teacher-Scholar Award and the Alpha Chi Sigma Award for Chemical Engineering Research.

Laboratory demonstrations will be presented by representatives from instrument manufacturing companies and by PhD students from Dr. Berg's research group. Scanning probe microscopy techniques will be demonstrated by Prof. D. Eric Aston, Professor of Chemical Engineering at the University of Idaho.

Comprehensive textbook

You will receive a detailed textbook (> 500 pp.), prepared for this course, covering all of the lecture material, and more.

What is included

Your registration fee includes the textbook, instruction, one luncheon at Ivar's Salmon House, all refreshment breaks, and a certificate of completion awarding 3.0 Continuing Education Units (CEU's).

Housing and lodging

For information about lodging near the University of Washington, log onto: <http://www.engr.washington.edu/epp/lodging.html>

Limited space is available in the dorms on campus. You will find information at the bottom of the lodging web page above.

Registration information

Fee: \$1575 (for registration before Aug. 13, 2007; \$1675 thereafter)

To register

- **By telephone**, using VISA or MasterCard, or for more information, please contact
Engineering Professional Programs
1-866-791-1275 (toll free), or e-mail
uw-epp@engr.washington.edu
- **Online**: Log onto www.engr.washington.edu/epp/scs/
- **By mail or fax**: Complete and mail or fax the form below to
Engineering Professional Programs
University of Washington
10303 Meridian Ave. North #301
Seattle, WA 98133-9483
Fax: (206) 543-2352

Substitution/Cancellation

If you register and cannot attend, you may send another person in your place. A refund of the registration fess, less \$100, will be granted if requested prior to Aug. 13, 2007. After that, a total of \$200 will be deducted from your refund.

Registration form: Surfaces, Colloids and Nanoscience

Fee: \$1575 (for registration after Aug. 13, 2007; \$1675 thereafter)

Registrant information

NAME: _____

ORGANIZATION: _____

ADDRESS: _____

CITY: _____

STATE: _____

ZIP: _____

PHONE: _____

FAX: _____

E-MAIL*:

* Confirmation of enrollment and payment will be e-mailed to you. If you require a printed copy, call EPP at 1-866-791-1725 or e-mail at uw-epp@enr.washington.edu.

Payment method

Registration Fee: \$ _____ (\$US)

Total Payment: \$ _____ (\$US)

Check enclosed, payable to University of Washington

VISA Mastercard

ACCOUNT NUMBER: _____

EXP. DATE: _____

NAME ON CARD: _____

CARDHOLDER SIGNATURE _____

Purchase order attached

PURCHASE ORDER REFERENCE NUMBER: _____

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Surfaces, Colloids and Nanoscience

August 20 -24, 2007

Course Outline

MONDAY

Morning – Lectures

- What is nanoscience?
- Intermolecular forces; capillarity
- Meniscus configurations, Young-Laplace analysis
- Curvature effects; Kelvin equation; nucleation phenomena
- Thin films and nanofilms
- Micro and macro contact angles; Young's equation
- Wetting, spreading; adhesion criteria

Afternoon – Laboratory demonstrations

- Surface/interfacial tension measurement: Du Nüoy ring, Wilhelmy slide, pendant drop, maximum bubble pressure (Krüss USA, FTÅ Insts.) Langmuir film balance.
- Contact angle measurement: goniometer (Krüss USA, FTÅ Insts.) dynamic fiber balance.
- The electrodynamic balance

TUESDAY

Morning – Lectures

- Solid surface modification
- Wicking, absorbency, microfluidics
- Solid surface characterization
 - Scanning probe microscopy (AFM, STM, NSOM)
 - Profilometry, surface area of powders
 - Inverse gas chromatography (IGC)
- Interfacial thermodynamics; surfactants
- Thin films and nanofilms
- Micelles, microemulsions, solubilization, detergency

CATERED LUNCHEON AT IVAR'S SALMON HOUSE

Afternoon – Laboratory demonstrations

- Mercury porosimetry, BET surface area (Micromeritics)
- Disk centrifuge (Brookhaven Insts.)
- Scanning probe techniques (Atomic force microscopy AFM; Scanning tunneling microscopy STM; Pulsed force mode PFM)(Park Sci. Insts; WiTec)

WEDNESDAY

Morning – Lectures

- Self-assembled nanostructures in solution; vesicles, tubules, nanorods, bilayers, etc.
- Monolayers, Langmuir-Blodgett films
- Preparation of colloids and nanodispersions
- Particle size distribution, shape
- Sedimentation; Brownian motion
- Optical methods and light scattering

Afternoon – Laboratory demonstrations

- Classical light scattering and photon correlation spectroscopy, PCS (Brookhaven Insts.)
- SediGraph and Elzone particle sizing (Micromeritics)
- Mastersizer 2000 and Zetasizer Nano (Malvern Insts.)

THURSDAY

Morning – Lectures

- Electrostatic interactions; the electric double layer
- Long-range van der Waals/Lifshitz interactions
- Colloid stability; DLVO theory; beyond DLVO
- Kinetics and morphology of aggregation
- Electrokinetic phenomena
- Rheology of dispersions

Afternoon – Laboratory demonstrations

- Rheometry: Bohlin Gemini (Malvern Insts)
- Electroacoustic measurements (Colloidal Meas. Co.)
- Electrophoretic light scattering, zeta potential measurement; ZetaPALS (Brookhaven Insts.)

FRIDAY

Morning – Lectures

- Preparation/testing of emulsions
- Coalescence, demulsification
- Preparation/testing of foams
- Froth flotation; adsorptive bubble separations
- Interfacial hydrodynamics; Marangoni effects

