

SYMPOSIUM JJ

The Undergraduate Curriculum in
Materials Science and Engineering (MSE)

December 2 - 4, 2002

Chairs

Elliot P. Douglas	Univ of Florida
Oscar D. Dubon	Univ of California-Berkeley
Jacqueline A. Isaacs	Northeastern Univ
William B. Knowlton	Boise State Univ
M. Stanley Whittingham	SUNY-Binghamton

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Symposium Proceedings Series

* Invited paper

SESSION JJ1:

Chair: M. Stanley Whittingham
Monday Afternoon, December 2, 2002
Republic A (Sheraton)

1:30 PM *JJ1.1
LURING UNDERGRADUATES TO MATERIALS SCIENCE.
Gregory C. Farrington, Department of Materials Science and
Engineering, Lehigh University, Bethlehem, PA.

2:00 PM *JJ1.2
AN INTRODUCTION TO MATERIALS SCIENCE FOR
BIOENGINEERS: STRUCTURE AND PROPERTIES OF
BIOMATERIALS. William R. Graham, The University of
Pennsylvania, Dept. of Materials Science and Engineering,
Philadelphia, PA.

2:30 PM *JJ1.3
MATERIALS SCIENCE EDUCATION AT KEIO UNIVERSITY:
ADOPTING U.S. INSTRUCTION PRACTICES IN JAPAN.
Kohei M. Itoh, Keio Univ, Dept of Applied Physics, Yokohama,
JAPAN.

3:00 PM BREAK

3:30 PM *JJ1.4
THE NEW MSE CURRICULUM AT THE OHIO STATE
UNIVERSITY. Prabhat Gupta, Robert Snyder, The Ohio State
University, Dept of Materials Science and Engineering, Columbus, OH.

4:00 PM *JJ1.5
TOWARDS A NEW UNDERGRADUATE CURRICULUM IN
MATERIALS SCIENCE & ENGINEERING. Donald R. Sadoway,
Department of Materials Science and Engineering, Massachusetts
Institute of Technology, Cambridge, MA.

4:30 PM JJ1.6
THE CYMBALS AS AN INSTRUCTIONAL DEVICE FOR
MATERIALS EDUCATION. Mary Anne White, Dept. Chemistry and
Institute for Research in Materials, Dalhousie University, Halifax,
CANADA.

4:45 PM JJ1.7
THE NSF NSDL GREEN DIGITAL LIBRARY: GREEN'S
FUNCTIONS RESEARCH AND EDUCATION ENHANCEMENT
NETWORK. Laura M. Bartolo, Kent State University, Applied
Linguistics Institute, Kent, OH; Adam C. Powell IV, Massachusetts
Institute of Technology, Materials Science and Engineering
Department, Cambridge, MA; Gregory M. Shreve, Kent State
University, Applied Linguistics Institute, Kent, OH; Vinod K. Tewary,
National Institute of Standards and Technology, Materials Reliability
Division, Boulder, CO.

SESSION JJ2:

Chair: Oscar D. Dubon
Tuesday Morning, December 3, 2002
Republic A (Sheraton)

8:30 AM *JJ2.1
EXCITEMENT IS THE KEY TO LEARNING ABOUT
MATERIALS. John J. Mecholsky Jr., University of Florida,
Department of Materials Science & Engineering, Gainesville, FL.

9:00 AM JJ2.2
USING INTERACTIVE MULTIMEDIA TOOLS TO TEACH
ANALYTICAL TECHNIQUES IN THE UNDERGRADUATE
CURRICULUM. Karin Prüßner^a, Klaus Pingel^b, Jens Becker^b,
Horst-Peter Dressel^a, Christof Reiner^c, Marc Schlosser^c and
Hans-Jürgen Christ^a; ^aInstitute for Materials Technology, University
of Siegen, GERMANY; ^bInstitute of Physics, University of Siegen,
GERMANY; ^cInstitute of Inorganic Chemistry, University of Siegen,
GERMANY.

9:15 AM JJ2.3
TECHNIQUES FOR STUDYING SOLIDS: AN ON-LINE
APPROACH TO JUST IN TIME LEARNING FOR MATERIALS
CHARACTERIZATION. Wayne E. Jones Jr., Chuan-Jian Zhong, and
M. Stanley Whittingham, Department of Chemistry and Institute for
Materials Research, State University of New York at Binghamton,
Binghamton, NY.

9:30 AM JJ2.4
MANAGING STUDENT GROUP PROJECTS IN AN
INTRODUCTORY MATERIALS SCIENCE COURSE.
Jacqueline A. Isaacs, Northeastern University, Boston, MA.

9:45 AM BREAK

10:15 AM JJ2.5
A TWO COURSE SEQUENCE FOR INTRODUCTION TO
MATERIALS. Elliot P. Douglas, Univ of Florida, Dept of Materials
Science and Engineering, Gainesville, FL.

10:30 AM *JJ2.6
USING INTERDISCIPLINARY EXAMPLES IN NANOTECH-
NOLOGY TO TEACH CONCEPTS OF MATERIALS SCIENCE
AND ENGINEERING. Wendy C. Crone, Department of Engineering
Physics, University of Wisconsin-Madison, Madison, WI; Arthur B.
Ellis, Department of Chemistry, University of Wisconsin-Madison,
Madison, WI; George C. Lisensky, Department of Chemistry, Beloit
College, Beloit, WI; S. Michael Condren, Department of Chemistry,
Christian Brothers University, Memphis, TN; Amy Payne,
Department of Chemistry, University of Wisconsin-Madison, Madison,
WI; Ken Lux, Department of Engineering Physics, University of
Wisconsin-Madison, Madison, WI.

SESSION JJ3: IN-ROOM POSTER SESSION

Chair: Oscar D. Dubon
Tuesday Morning, December 3, 2002
11:00 AM
Republic A (Sheraton)

JJ3.1
TOOLS FOR TEACHING NANOTECHNOLOGY CONCEPTS IN
MATERIALS SCIENCE AND ENGINEERING. Wendy C. Crone,
Department of Engineering Physics, University of Wisconsin-Madison,
Madison, WI; Arthur B. Ellis, Department of Chemistry, University of
Wisconsin-Madison, Madison, WI; George C. Lisensky, Department of
Chemistry, Beloit College, Beloit, WI; S. Michael Condren,
Department of Chemistry, Christian Brothers University, Memphis,
TN; Amy Payne, Department of Chemistry, University of
Wisconsin-Madison, Madison, WI; Ken Lux, Department of
Engineering Physics, University of Wisconsin-Madison, Madison, WI.

SESSION JJ4:

Chair: Jacqueline A. Isaacs
Tuesday Afternoon, December 3, 2002
Republic A (Sheraton)

1:30 PM JJ4.1
MATERIALS SCIENCE IN A PROJECT-CENTERED,
INTERDISCIPLINARY COURSE BLOCK. Jonathan Stolk, Hillary
Berbeco, Robert Martello, Franklin W. Olin College of Engineering,
Needham, MA.

1:45 PM JJ4.2

INCORPORATING MATERIALS SCIENCE INTO AN UNDERGRADUATE APPLIED PHYSICS CURRICULUM. Claudio Guerra-Vela, University of Puerto Rico at Humacao, Dept of Physics and Electronics, Humacao, PR; Fredy Zypman, Yeshiva Univ, Dept of Physics, New York, NY.

2:00 PM JJ4.3

INSTRUCTIONAL LABORATORY EXERCISES FOR UNDERGRADUATE STUDENTS IN SOLID-STATE PHYSICS OR MATERIALS SCIENCE. Colin Inglefield, Weber State University, Department of Physics, Ogden, UT; Royce Anthon, University of Utah, Department of Physics, Salt Lake City, UT.

2:15 PM JJ4.4

WEB-BASED DATA ANALYSIS AND FEEDBACK FOR GENERAL CHEMISTRY LABORATORY: IMPROVING ANALYSIS WITH TIMELY, DISTANCE FEEDBACK. Joseph F. Lomax, Debra K. Dillner, Melonie A. Teichert, U.S. Naval Academy, Chemistry Dept, Annapolis, MD.

2:30 PM JJ4.5

THE JUNIOR LABORATORY: A PLACE TO INTRODUCE BASICS AS WELL AS NEW FINDINGS. Luz J. Martinez-Miranda, O.C. Wilson Jr. and L.G. Salamanca-Riba, Dept. of Materials and Nuclear Engineering, University of Maryland, College Park, MD.

2:45 PM BREAK

3:15 PM JJ4.6

INTRODUCING UPPER DIVISION NON-ENGINEERING STUDENTS TO MATERIALS. D.F. Bahr, M.G. Norton, Washington State Univ., Mechanical and Materials Engineering, Pullman, WA.

3:30 PM JJ4.7

PUI/MRSEC COLLABORATION TO CREATE OPPORTUNITIES FOR WOMEN IN MATERIALS RESEARCH. Velda Goldberg, Physics Department, Simmons College, Boston, MA; Michael Kaplan, Chemistry and Physics Department, Simmons College, Boston, MA; Leonard Soltzberg, Chemistry Department, Simmons College, Boston, MA; George Malliaras, Materials Science and Engineering Department, Cornell University, Ithaca, NY; Helene Schember, Nevjinder Singhoti, Cornell Center for Materials Research (CCMR), Cornell University, Ithaca, NY.

3:45 PM JJ4.8

LABORATORY ON A COMPUTER. Mikhail I. Mendeleev, David J. Srolovitz, Princeton Materials Institute & Dept. of Mechanical & Aerospace Engineering, Princeton University, Princeton, NJ; B.S. Bokstein, Moscow State Institute of Steel and Alloys, Moscow, RUSSIA.

SESSION JJ5:

Chair: William B. Knowlton
Wednesday Morning, December 4, 2002
Republic A (Sheraton)

8:30 AM *JJ5.1

PREPARING FOR SUCCESS: INDUSTRIAL SKILLS FOR MATERIALS ENGINEERS. Kristin J. Duxstad, Recording Head Operations, Seagate Technology, Minneapolis, MN.

9:00 AM *JJ5.2

CHANGING SKILL SET NEEDED FROM MS&E EDUCATION DUE TO EVOLUTION OF THE Si MICROELECTRONICS INDUSTRY. Christopher S. Olsen, Applied Materials, TCG, Santa Clara, CA.

9:30 AM JJ5.3

UTILIZING INDUSTRIAL APPLICATIONS TO DESIGN AN ADVANCED UNDERGRADUATE CHEMISTRY LABORATORY. Jason J. Keleher and Yuzhuo Li, Department of Chemistry Center for Advanced Materials Processing, Clarkson University, Potsdam, NY.

9:45 AM BREAK

10:15 AM JJ5.4

ATOMIC EXPLORERS: A CASE STUDY TEACHING MATERIALS SCIENCE IN A VIRTUAL ENVIRONMENT. Frank Cherne, Los Alamos National Laboratory, MST-8, Structure and Property Relations, Los Alamos, NM; Pierre Deymier, The University of Arizona, Dept of Materials Science and Engineering, Tucson, AZ.

10:30 AM JJ5.5

APPLICATION OF CDIO METHODS IN THE MSE

CURRICULUM. David Roylance, Massachusetts Institute of Technology, Dept of Materials Science and Engineering, Cambridge, MA.

10:45 AM JJ5.6

NON-DESTRUCTIVE TECHNIQUES FOR THE CHARACTERIZATION OF STRUCTURAL MATERIALS. Antonia Moropoulou, Nikolaos P. Avdelidis, Eleni Aggelakopoulou, Natl Technical Univ of Athens, Athens, GREECE.

11:00 AM *JJ5.7

THE UNDERGRADUATE CORE COURSE IN THERMODYNAMICS IN MATERIALS SCIENCE AND ENGINEERING. Robert DeHoff, University of Florida, Dept. of Materials Science and Engineering, Gainesville, FL.

SESSION JJ6:

Chair: Elliot P. Douglas
Wednesday Afternoon, December 4, 2002
Republic A (Sheraton)

1:30 PM *JJ6.1

THE INTRODUCTORY MATERIALS SCIENCE AND ENGINEERING COURSE. William D. Callister, University of Utah, Salt Lake City, UT.

2:00 PM *JJ6.2

A STUDIO VERSION OF AN INTRODUCTORY MATERIALS COURSE. Linda S. Schadler, J.B. Hudson, Materials Science and Engineering Department, Rensselaer Polytechnic Institute, Troy, NY.

2:30 PM JJ6.3

TEACHING GENERAL CHEMISTRY VIA A MATERIALS-CENTERED CURRICULUM: REINVIGORATING ENGINEERING EDUCATION. Donald R. Sadoway, Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA.

2:45 PM JJ6.4

A MULTI-FUNCTIONAL INTRODUCTORY MATERIALS SCIENCE COURSE: EMPHASIZING ENGINEERING AND ACHIEVING ACCREDITATION OBJECTIVES. K.C. Chen, L. Vanasupa, and T. Orling, Materials Engineering Department, California Polytechnic State University, San Luis Obispo, CA.

3:00 PM JJ6.5

EFFECTIVE TEACHING IN THE INTRODUCTORY MATERIALS COURSE. R. Gibala, Department of Materials Science and Engineering, University of Michigan, Ann Arbor, MI.