





### **Innovative Teaching Techniques:**

1.- Extensive use of hypertext interlinked web pages and the internet for course development and support. Course content and student progress uploaded to and continuously updated in custom designed Internet class pages. I have pioneered the concept of class portfolios where class pages contain information not only about policy and syllabus as well as lecture notes, homework assignments, sample problems, computer programs, and exams but, most importantly, links to student-developed web pages documenting their own achievements in the learning process.

Students in my courses are required to develop and maintain learning portfolios in their own web pages. Portfolios are reviewed periodically over the course of the semester. Together with my class web page, the student pages become a class portfolio which is readily and widely available on the internet (see <http://ww.ewp.rpi.edu/~ernesto>).

2. Students in most of my courses are often required to perform research projects fulfilling the following requirements:

- a) Intellectually challenging
- b) Academically sound
- c) Directly related to a topic contained in the course syllabus
- d) Directly related to an ongoing activity at their place of employment
- e) Personally interesting

Students periodically present project updates to the class and a final written report is submitted and also defended in front of the class. Reports are graded and contribute significantly to the final class grade.

3. Computer simulation laboratories. Students in most of my courses are required to experiment in computer simulation laboratories. Laboratories typically contain collections of software programs. The programs are designed and sequenced to match the course outline. Software utilized in the labs includes home-made, research as well as commercial codes.

4. New course development. I have conceived, developed and taught many new courses. On average, I have developed and delivered about 1-2 new courses every year over the past 20 years. New course contents design criteria are: a) high academic standards and b) industrial/business relevance. Average class size for new courses has been around 15.

5. New program development. I conceived, developed and have taught consistently new course and programs over the past 20 years.

- Since my arrival in 1987 and until 1995 I was actively involved in the development of

new curriculum and courses for our Master of Science in Metallurgy.

- Between 1991 and 1996, I developed and organized our first Graduate Certificate in the Engineering Department (Pollution and Waste Prevention in Manufacturing). I developed and taught three of the four courses in the certificate. Courses were taught on campus and also at various corporate sites.
  - Between 1995 and 1998 I taught a number of new courses in the Lally School of M&T at the Hartford campus.
  - Since 1997 I have been involved in the development of curriculum and oversight of our Graduate Certificate program in High Temperature Materials .
  - Between 1998 and 2004 I was responsible for the oversight of two new Graduate Certificate Programs in Decision Sciences and Engineering Systems (Quality and Reliability Engineering and Systems Modeling and Analysis) and I have taught the course Simulation Modeling and Analysis (subsequently changed to Discrete Event Simulation) which was part of the latter certificate.
  - Between 2002-2005 I was actively involved in the development of new curricula for all of our new Master of Engineering degrees. I was directly responsible for developing specific content for the Mechanical Engineering degree. I coordinated the creating of the necessary documentation to request and obtain approval from the CT Board of Higher Education to offer the new degrees in addition to the old.
  - Between 2005-2006 I was actively engaged in the process of developing a new cohort program for United Technologies Corporation in the general area of Product Quality and Process Certification. The end result of that effort was our flagship IPM Cohort Program being offered since 2007. I have developed and presented a new course in Statistical Methods in Reliability Engineering multiple times as part of this program.
  - Since 2005 I have participated in the creation, recruitment, operation and advising of cohort groups pursuing the Master of Engineering in mechanical Engineering degree for General Dynamics-Electric Boat in the Groton campus. Cohort MESE05 will start their program on Spring 2009.
  - Since 2007 I have been offering MANE-6980 Engineering Project in a 15-week, 3-hr long, classroom meeting format where I lead, coach and advise groups of students working in their culminating experience for the degree. As a result of this new format, the proportion of students who are able to complete the requirement within one academic term has increased significantly.
6. I have worked closely with United Technologies Learning Center staff in the development of proposed curricula for several Graduate Certificate and Degree Programs.

7. Distance Teaching. I have taught and continue to teach courses using distance education technology.
8. On-Site Teaching. I have taught complete courses as well as portions of courses at industrial on-site locations as needed.
9. Team Teaching. I have participated as team member in teaching courses both in the School of Engineering and in the School of Management.
10. Summer Teaching. I have taught several of our regular courses during the summer term as required. I was invited by Mexican institutions to give short summer courses in 1998, 1999, 2000, 2003, 2004 and 2005.
11. Summer Research. I have spent time each year in Saltillo/Monterrey, Mexico doing joint research with coworkers at CINVESTAV on the modeling of continuous thin strip casting of steel in the period 2000-2008.
12. I have been working closely with the Marketing team over the past 4-5 years to increase enrollment in our advanced Studies Program. The number of students in the Mechanical Engineering Program now is around 200 (almost 30% of the total number of students in the Hartford Campus).
13. I am listed by the Registrar's Office as the official Faculty Advisor to almost 200 students in the Mechanical Engineering Program. I am available to all these students around the clock to answer their questions and provide academic and curricular guidance, over the phone, e-mail or in person at my office in Room 746.

### **Educational Preparation**

- (1) Baccalaureate and graduate degree(s), institution, date

Doctor of Philosophy in Metallurgy, Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge MA, 1985.

Chemical Metallurgical Engineer, Department of Metallurgy, National University of Mexico, Mexico, 1978.

### **Non-degree preparation**

I have made a personal commitment to attend and participate in professional and intellectual development activities on an on going basis and often at my own expense. Following is a list of activities.

International Summer School on Solidification and Casting of Metals, Sanga Saby, Sweden, 29 August - 2 September, 1988.

Kaizen and Quality Function Deployment, Hartford Graduate Center, Hartford, CT.,  
October 30 - November 1, 1989.

NATO Advanced Study Institute and Seminars de Mathematiques Superieures on Shape  
Optimization and Free Boundaries, University de Montreal Montreal, Canada, June 25 -July 13,  
1990.

IMA Workshop on Free Boundaries in Viscous Flows, Institute for Mathematics and its  
Applications, University of Minnesota, Minneapolis, Minnesota, March 11-15 , 1991.  
ASEE Faculty Professional Development Program: Introduction to Manufacturing,  
Massachusetts Institute of Technology, Cambridge, MA, June 17-28, 1991.

Course Heat Transfer Analysis by Finite Elements Methods Using Analysis 5.0, Computer  
Aided Engineering Associates, Woodbury, CT, April 13-15, 1992.

Ecole Polytechnique Workshop on Fractals In Engineering, Universite de Montreal, Montreal,  
Canada, June 3-5, 1992.

IMM Workshop on Computational Modeling of Materials with Evolving Microstructures,  
Institute for Mechanics and Materials, University of California, San Diego, CA, April 19-22,  
1993.

IMA Summer Program on Modeling, Mesh Generation and Adaptive Numerical Methods for  
Partial Differential Equations, Institute for Mathematics and its Applications, University of  
Minnesota, Minneapolis, MN, July 1-31, 1993.

IMM Summer School: The Mechanics-Materials Linkage, Institute for Mechanics and  
Materials, University of Maryland, College Park, MD, August 9-20, 1993.

SFM Workshop on Materials Recycling: Technical Possibilities And Potential, Swedish  
Society for Materials Technology Royal Swedish Academy of Engineering Sciences,  
Stockholm, Sweden, April 19-20, 1994.

SIA Workshop on Casting and Solidification of Metals: From Research Results to Practical  
Applications, Swedish Ironmaster's Association, Bro, Sweden, May 25, 1994.

Workshop on Development Of High Integrity Powder Metallurgy Products Through Computer  
Modeling, Concurrent Technologies Corporation, Johnstown, PA., April 25-27, 1995.

IMM Workshop on Micromechanics In Materials Processing And Manufacturing, Institute for  
Mechanics and Materials, Brown University, Providence, RI., June 22-23, 1995.

Advances In Computational Fluid Dynamics: A Short Course, Louisiana Tech University,  
Ruston, LA, June 24-29, 1996.

International System Dynamics Conference, Cambridge, MA, July 21-25, 1999  
Workshop on Introduction to Systems Thinking and the Stella Software, Durham, NH,

Workshop on Introduction to Systems Thinking and the Stella Software, Durham, NH,  
August 5-8, 1996.

Mathematical Aspects Of Materials Science: Second Society Of Industrial And Applied  
Mathematics Conference, Philadelphia, PA, May 12-14, 1997.

International Symposium On Current And Future Challenges In Applied Mathematics, Brown  
University, Providence, RI, May 29-31, 1997.

Winter Simulation Conference, Washington D.C., December 13-16, 1989.

Mathematical Aspects of Materials Science, Third Conference of the Society for Industrial and  
Applied Mathematics, Philadelphia, PA , May 22-24, 2000.

Processing for Control of Microstructure Evolution and Performance, Gordon Research  
Conference in Physical Metallurgy, Holderness, NH, July 23-28, 2000.

Annual Colloquium on Teaching and Learning, RPI, Troy, May 7-8, 2001

Annual Colloquium on Teaching and Learning, RPI, Troy, May 13-14, 2002

Annual Colloquium on Teaching and Learning, RPI, Troy, May 12-13, 2003

National Science Foundation Summer School on Free Boundary Problems,  
Detroit, May 18-22, 2003

IMA Summer School on Probability and Partial Differential Equations,  
Institute for Mathematics and its Applications, University of Minnesota,  
Minneapolis, MN, July 21-25, 2003.

ADAPT03-The Joe Flaherty Conference, RPI, Troy, October 11-12, 2003

Gordon Research Conference in Tribology, Roger Williams University, Rode Island, June 27-  
July 2, 2004.

Gordon Research Conference in Physical Metallurgy, Holderness, New Hampshire, July 25-30,  
2004.

Third Wave Systems-AdvantEdge Machining Modeling Software User's Conference,  
Dearborn, MI, May 3-5, 2005.

Annual Colloquium on Teaching and Learning, RPI, Troy, May 16-17, 2005

Eastec 2005 Exhibition, West Springfield, MA, May 24-25, 2005.

Modeling Materials Processing Conference, WPI, Worcester, MA, May 26, 2005.

The Third MIT Conference on Computational Fluid and Solid Mechanics, Cambridge, MA, June 14-17, 2005.

System Dynamics Society Conference, Boston, MA, July 17-21, 2005.

Laser Hole Drilling Conference, Hartford, CT, November 7-8, 2005.

COMSOL Workshop, Windsor, CT, May 3, 2006.

Introduction and Advanced Workshops on Simulation Modeling with Crystal Ball, May 9-10, New York City, NY, 2006.

Eastec 2006 Exhibition, West Springfield, MA, May 24-25, 2006.

International Conference of the CIRP on High Speed Machining, Vancouver, Canada, June 11-13, 2006.

Machining Modeling using CUTPRO, Vancouver, Canada, June 14-15, 2006.

Gordon Research Conference in Tribology, Waterville, ME, June 18-23, 2006.

Gordon Research Conference in Physical Metallurgy, Holderness, NH, July 25-30, 2004.

Third Wave Systems – User’s Conference – Modeling of Machining, Dearborn, MI, May 3-5, 2005.

Society of Manufacturing Engineers – EASTEC Advanced Productivity Exposition, West Springfield, MA, May 24-25, 2005.

Materials Modeling to Improve Processes and Products, Metal Processing Institute, Worcester Polytechnic Institute, Worcester, MA, May 26, 2005.

Third MIT Conference on Computational Fluid and Solid Mechanics, MIT, Cambridge, MA, June 14-17, 2005.

System Dynamics Society 2005 Conference, Boston, MA, July 17-21, 2005.

Laser Hole Drilling Workshop, Connecticut Center for Advanced Technologies, Hartford, CT, November 7-8, 2005

Introduction and Advanced Monte Carlo Modeling with Crystal Ball, Decisioneering, NYC, May 9-10, 2006.

Society of Manufacturing Engineers – EASTEC Advanced Productivity Exposition, West Springfield, MA, May, 2006.

Second International Conference in High Performance Cutting, CIRP, UBC Vancouver, Canada, June 12-13, 2006.

Introduction and Advanced CutPro, Manufacturing Automation Laboratories, UBC, Vancouver, Canada, June 14-16, 2006.

Gordon Research Conference in Tribology, Colby College, Waterville, ME , June 18-23, 2006.

Gordon Research Conference in Physical Metallurgy, Holderness School, Plymouth, NH, July 23-28, 2006.

Laser Hole Drilling Workshop, Connecticut Center for Advanced Technologies, Hartford, CT, October 26-27, 2006.

Third Wave Systems User's Conference, Seattle, WA, May 15-17, 2007 (Presenter).

Eastec Manufacturing Show and Exhibition, West Springfield, MA, May 22-23, 2007.

ESI-Short Intensive Course on Resin Transfer Molding Modeling, CCAT, East Hartford, CT, June 26-28, 2007.

International Conference in Industrial and Applied Mathematics, Zurich, Switzerland, July 16-20, 2007.

COMSOL User's Conference, October 4-6, 2007, Newton, MA (Presenter – 3 talks).

Siemens Aerospace Workshop, Middletown, CT, Feb 20, 2008

VisualMesh Training Workshop, ESI Group-CCAT, East Hartford, Feb 29, 2008

DEFORM Training Workshop, Scientific Forming Technologies-CCAT, East Hartford, Mar 25-27, 2008

Symposium for Aerospace Laser Applications, CCAT, East Hartford, April 2-3, 2008

SysWeld Training Workshop, ESI Group-CCAT, East Hartford, April 7-9, 2008

Gordon Research Conference on Tribology, Colby College, Waterville, ME, June 6-11, 2008

Trumpf Laser Welding and Laser Metal Deposition Seminar, CCAT, East Hartford, CT August 14, 2008

International STEP-NC Meeting and Demonstration, UTRC/CCAT, East Hartford, October 1-2, 2008

COMSOL User's Conference, Boston, MA (Presenter, 3 papers – 3 talks)  
October 9-11, 2008

## II. **Professional Experience**

(Give postdoctoral, teaching, industrial, governmental, and private practice experience prior to joining Rensselaer, giving position, employer, and dates.)

Visiting Researcher, CINVESTAV-Salttillo, Mexico, summers 2001-2005.

Visiting Professor, CINVESTAV-Salttillo, Mexico, summers 2003, 2004, 2005

Visiting Professor, Trinity College, Hartford, CT, Spring 1995, 1996, 1997, 2001.

Visiting Lecturer, Mexican Iron and Steel Society, Monterrey, Mexico, July 2000.

Visiting Lecturer, Mexican Iron and Steel Society, Monterrey, Mexico, July 1999.

Visiting Lecturer, School of Engineering, Universidad Iberoamericana, Mexico, June 1998,  
June 2003

Visiting Researcher, Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, Summer 1995

Visiting Researcher, Swedish Institute for Metals Research, Stockholm, Sweden, January – August 1994

Technical Consultant, private practice, 1/79 to date.

Expert Translator, private practice, 1/78 to date.

Postdoctoral Associate, Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, 9/85-6/87.

Visiting Scientist, Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA, Summer 1995

Lecturer in Materials Science, Department of Metallurgy, National University of Mexico, Mexico, 1/78-12/79.

### III. Teaching

#### A. Courses

(List the number and title of each course taught and approximate number of students in each course; Include undergraduate project supervision and courses that you have supervised with the number of instructors and students involved.)

Course	Course Title	Term	Students	Location
36446	Metall. Transf.	Fall 1987	11	Hartford
36606	Kin. of Matl's Reacns	Spring 1988	15	Hartford
36496	Topics: Materials Applicns	Spring 1988	26	Hartford (1/3)
36611	Diffusion in Solids	Summer 1988	5	Hartford
36645	Melting and Solidif.	Fall 1988	5	Hartford
36421	Mech. Prop. of Matl's	Fall 1988	13	Hartford (1/2)
37696 Topics:	Manuf. Matls & Proc.	Spring 1989	28	Hartford
36851	Srength. Mech. Solids	Spring 1989	7	Hartford(1/3)
36431	Corrosion	Spring 1989	8	Hartford(1/3)
37696 Topics:	Manuf. Matls & Proc.	Summer 1989	25	Groton
36601	Defects in Solids	Summer 1989	4	Hartford(1/2)
36683	Def. Matls & Rheology	Fall 1989	3	Hartford (1/2)
36606	Kin. of Matl's Reaction	Spring 1990	8	Hartford
36696 Topics:	Machining	Summer 1990	11	Hartford
36496 Topics:	Statis. Qual. Con.	Summer 1990	12	Hartford
36625	Powders & Sintering	Summer 1990	5	Hartford (1/2)
36421	Mech. Prop. of Matl's	Fall 1990	14	Hartford
36696	Microelectronics Matl's	Fall 1990	10	Hartford
37663	Conduction Heat Transfer	Fall 1990	24	Hartford
36807	Engineering Materials	Spring 1991	12	Hartford
36410	Thermodyn. of Solids	Fall 1991	13	Hartford
36696 Topics :	Pollution & Waste Mfg	Fall 1991	21	Hartford
37663	Conduction Heat Transfer	Fall 1991	15	Groton
37696 Topics:	Pollution & Waste Mfg.	Fall 1991	15	UTC (OL)

#### IV. Teaching(Cont)

Course	Course Title	Term	Students	Location
36606	Kin. of Matl's Reactions	Spring 1992	10	Hartford(2/3)
36696 Topics:	Clean Tech. Metals Proc.	Spring 1992	26	Hartford
266	Mechanics II	Spring 1992	6	Trinity Coll. (Xchg)
36611	Diffusion in Solids	Summer 1992	6	Hartford
36696 Topics:	Clean Tech. Metals Proc.	Summer 1992	14	UTC (OL)
36470	Comp. Exp. in Matl's Eng	Fall 1992	5	Hartford
36696 Topics:	Poll. Free Plastics Proc.	Fall 1992	9	Hartford
37663	Conduction Heat Transfer	Fall 1992	16	Hartford
36696 Topics:	Poll. Free Plastics Proc.	Fall 1992	17	UTC (OL)
36696 Topics:	Pollution & Waste Prev.	Spring 1993	37	Hartford (1/3) DL Trinity Coll.
266	Mechanics II	Spring 1993	10	(XChg)
36496 Topics:	Pollution & Waste Mfg	Fall 1993	14	Hartford (1/3)
<i>Note: Sabbatical Leave at the Swedish Institute for Metals Research,</i>		<i>January - August 1994.</i>		
37663	Conduction Heat Transfer	Fall 1994	8	Hartford
37663	Conduction Heat Transfer	Fall 1994	28	Groton
36696 Topics:	Poll. Free Plastics Proc.	Fall 1994	13	Hartford
36696 Topics:	Advanced Machining	Spring 1995	18	Hartford (OL)
36496 Topics:	Pollution & Waste Prev.	Spring 1995	11	Hartford
36496 Topics:	Light Metal Alloys	Spring 1995	7	Hartford(1/3) Trinity Coll.
325	Strength of Materials	Spring 1995	7	(XChg)
36421	Mech. Props of Matl's	Fall 1995	15	Hartford
36496 Topics:	Pollution & Waste Mfg	Fall 1995	11	Hartford
265830	Math. of Eng. & Sci. II	Spring 1996	5	Groton
36431	Corrosion	Spring 1996	5	Hartford
36661	Deformation Processing	Spring 1996	14	Hartford
20696	Ind. Air Pollut. Prev.	Spring 1996	9	Hartford (1/3) Trinity Coll.
232L	Engineering Matls.	Spring 1996	30	(XChg)

**Teaching** (Cont.)

<b>Course</b>	<b>Course Title</b>	<b>Term</b>	<b>Students</b>	<b>Location</b>
36606	Kin. of Matls. Reacts.	Fall 1996	5	Hartford
36696 Topics:	Frict. & Wear Mtls	Fall 1996	19	Hartford
265441	Numerical Computing	Spring 1997	14	Groton
20696003	Ind. Water Pollut. Prev.	Spring 1997	13	Hartford (1/2)
36645	Melting and Solidif.	Spring 1997	10	Hartford
80696726	Mgt. Tech. & Soc. (MOT)	Spring 1997	17	Hartford
232L	Engineering Matls	Spring 1997	9	Trinity Coll.(XChg)
80696726	Mgt. Tech. & Soc. (MOT)	Spring 1997	17	UTC (OL)
36696	Math. Model. Matls Proc	Summer 1997	6	Hartford
80687	Intro to Env. Techn.	Summer 1997	9	Hartford (OL)
37696022 and 80696322	Model. & Analys. Mfg Sys	Fall 1997	17	Hartford
37663	Conduction Heat Transfer	Fall 1997	10	Hartford
80715090	Techn. Trends (MOT)	Fall 1997	15	Hartford
20696002	Ind. Air Poll. Prev. Contr.	Fall 1997	21	Hartford (1/3) /(OL/DL)
265830	Math. of Eng. and Sci	Spring 1998	14	Groton
180680	Ethical, Pol. and Leg. Cont of Bus	Spring 1998	16	Hartford(OL)
280688	Mgmt of Environmental Techn.	Spring 1998	19	Groton
	Computational Corrosion	Summer 1998	8	U. Ibero (Mex)
MANE-6980	Graduate Project	Fall 1998	1	Hartford
MATH-7020	Math. of Eng. and Sci.	Fall 1998	16	Hartford
MGMT-696	Clean Techn. Analysis	Fall 1998	17	Hartford
MANE-6980	Graduate Project	Spring 1999	2	Hartford
MGMT-7150	Tech. Trends	Spring 1999	18	Hartford
MATH-4960	Numerical Computing	Spring 1999	18	Groton
MATH-4960	Numerical Computing	Spring 1999	23	Hartford
MEAE-696 and MGMT-6960	Model. Analys. Manuf. Systems	Spring 1999	28	Hartford
MANE-6900	Graduate Seminar	Summer 1999	1	Hartford
	Phys. Met. & Therm. Proc. Steel	Summer 1999	40	ISS, Monterrey, Mexico
MANE-6900	Graduate Seminar	Fall 1999	2	Hartford

DSES-6620	Simulation Modeling & Analysis	Fall 1999	8	Hartford
MEAE-4960	Numerical Analysis for Eng.	Fall 1999	21	Hartford
MANE-6900	Graduate Seminar	Spring 2000	2	Hartford
MEAE-6630	Conduct. Heat Transf.	Spring 2000	22	Hartford/Groton
MEAE-7010	Math of Eng. & Sci.	Spring 2000	10	Groton
MANE-6900	Graduate Seminar	Summer 2000	1	Hartford
	Phys. Met. & Therm. Proc. Steel	Summer 2000	35	ISS, Monterrey, Mexico
MANE-6900	Graduate Seminar	Fall 2000	3	Hartford
DSES-6620	Simulation Modeling and Analysis	Fall 2000	17	Hartford
MEAE-7010	Math of Eng. & Sci.	Fall 2000	26	Hartford
MANE-6900	Graduate Seminar	Spring 2001	2	Hartford
MANE-6980	Graduate Project	Spring 2001	2	Hartford
MEAE-4960	Numerical Analysis for Eng.	Spring 2001	26	Hartford
MEAE-6960	Model. Analys. Manuf. Systems	Spring 2001	9	Hartford
MANE-6900	Graduate Seminar	Summer 2001	2	Hartford
MANE-6900	Graduate Seminar	Fall 2001	7	Hartford
MEAE-4960	Numerical Analysis for Eng.	Fall 2001	27	Hartford
DSES-6620	Simulation Modeling and Analysis	Fall 2001	10	Hartford
MANE-6900	Graduate Seminar	Spring 2002	3	Hartford
MEAE-6630	Conduct. Heat Transfer.	Spring 2002	6	Groton
DSES-6620	Simulation Modeling and Analysis	Spring 2002	12	Sikorksy
MEAE-6630	Conduction Heat Transfer.	Spring 2002	18	Hartford
MANE-6900	Graduate Seminar	Summer 2002	1	Hartford
MANE-6980	Graduate Project	Summer 2002	1	Hartford
MANE-6900	Graduate Seminar	Fall 2002	1	Hartford
DESE-6620	Discrete Event Simulation	Fall 2002	12	Hartford
MANE-7010	Math of Engineering and Science	Fall 2002	25	Hartford/Groton
MANE-6900	Graduate Seminar	Spring 2003	4	Hartford
MANE-6980	Graduate Project	Spring 2003	2	Hartford
MANE-4960	Numerical Analysis for Eng.	Spring 2003	16	Hartford Hartford
MANE-6960	Model & Analysis of Mfg. Processes	Spring 2003	18	Hartford
MANE-6900	Graduate Seminar	Summer 2003	3	Hartford

MANE-6980	Graduate Project	Summer 2003	1	Hartford
MANE-6900	Graduate Seminar	Fall 2003	3	Hartford
MANE-7010	Math of Engineering & Science II	Fall 2003	32	Hartford
MANE-6900	Seminar in Mec.	Fall 2003	3	Hartford
MANE-6900	Graduate Seminar	Spring 2004	5	Hartford
MANE-6630	Conduction Heat Transfer	Spring 2004	5	Hartford
MANE-6960	Friction & Wear of Materials	Spring 2004	17	Hartford
MANE-6900	Graduate Seminar	Summer 2004	4	Hartford
MANE-6980	Graduate Project	Summer 2004	1	Hartford
MANE-6900	Graduate Seminar	Fall 2004	7	Hartford
MANE-6980	Graduate Project	Fall 2004	1	Hartford
MANE-7000	Advanced Eng. Mathematics II	Fall 2004	6	Hartford
MANE-4240	Intr to Finite Element Methods	Fall 2004	5	Hartford
MANE-6900	Graduate Seminar	Spring 2005	5	Hartford
MANE-7000	Advanced Eng. Mathematics II	Spring 2005	18	Hartford
MANE-7100	Mechanical Eng Foundations II	Spring 2005	20	Hartford
MANE-6900	Graduate Seminar	Fall 2005	5	Hartford
MANE-6980	Graduate Project	Fall 2005	4	Hartford
MANE-6960	Modeling & Analy. Machining Syst.	Fall 2005	5	Hartford
MANE-7100	Mechanical Eng Foundations II	Fall 2005	27	Hartford/Groton
MANE-7000	Advanced Eng. Mathematics II	Spring 2006	39	Hartford/Groton
MANE-6630	Conduction Heat Transfer	Spring 2006	8	Hartford
MANE-6900	Graduate Seminar	Summer 2006	10	Hartford
MANE-6980	Engineering Project	Summer 2006	2	Hartford
MANE-7100	Mechanical Eng Foundations II Engineering Project (weekly class mode)	Fall 2006	18	Groton
MANE-6980	Engineering Project (weekly class mode)	Fall 2006	10	Hartford
MANE-6900	Graduate Seminar	Fall 2006	10	Hartford
DSES-6070HV1	Statist. Meth. Reliability Eng	Spring 2007	5	Hartford
DSES-6070HV2	Statist. Meth. Reliability Eng	Spring 2007	12	Hartford
MANE-7000	Adv. Eng. Math II Engineering Project (weekly class mode)	Spring 2007	31	Hartford
MANE-6980	Engineering Project (weekly class mode)	Spring 2007	8	Hartford
MANE-6990	Engineering Thesis	Spring 2007	1	Hartford
MANE-6900	Graduate Seminar	Spring 2007	3	Hartford

MANE-6980	Engineering Project	Summer 2007	3	Hartford
MANE-6900	Graduate Seminar	Summer 2007	1	Hartford
DSES-6070HV3	Statist. Meth. Reliability Eng	Fall 2007	19	Hartford
DSES-6070HV2	Statist. Meth. Reliability Eng	Fall 2007	13	Hartford
MANE-6960	Topics: Friction and Wear	Fall 2007	10	Hartford
MANE-6980	Engineering Project	Fall 2007	1	Hartford
MANE-6990	Engineering Thesis	Fall 2007	1	Hartford
MANE-6900	Graduate Seminar	Fall 2007	4	Hartford
MANE-6940	Studies in Conduct. Heat Transf.	Fall 2007	1	Hartford
MANE-7000	Advanced Eng. Mathematics 2	Spring 2008	14	Groton
MANE-6980	Mechanical Engineering Project	Spring 2008	12	Hartford
DSES-6070	Statistical Methods Reliability Eng	Spring 2008	22	Stratford
MANE-6980	Mechanical Engineering Project	Summer 2008	6	Hartford
DSES-6070 (Overload)	Statistical Methods Reliability Eng	Summer 2008	21	Hartford/Maine
MANE-7100	Mechanical Engineering Found 2	Fall 2008	21	Groton
MANE-6980 Hartford	Mechanical Engineering Project	Fall 2008	12	Groton and
DSES-6070	Statistical Methods Reliability Eng	Fall 2008	15	Hartford

**B. Student Thesis Supervision**

**1. Thesis Completed**

(List student's name, title of thesis and year completed.)

**a. Bachelors**

NONE

**b.1 Master's Thesis**

D. Bedard, Computer Aided Selection Of Quality Control Procedures For The Clinical Laboratory, 1990

K.E. Gosselin The Effect Of Varying Preheat And Heat Input On The Heat Affected Zone Hardness Of A Pressure Vessel Steel, 1992

A.N. Verdes, The Identification Of The Significant Wear Mechanisms For Synthetic Diamond Electroplated Grinding Wheels Used To Grind Ti 6-4 Alloy, 1994

J. Albernaz, Bending Analysis of Laminated Composite Sandwich Plates reinforced with Carbon Nanotube Forests, 2007 (Co-advisor)

**b.2 Master of Science/Master of Engineering Projects/Seminars**

Seminar projects are graduation requirements for all students in Hartford. Students work on a small research project in conjunction with their advisor. Projects are often based on industrial problems. The research approach is scholarly. Typically students take between 6 months to a year to complete the required work. Final reports are produced, revised and archived at the Rensselaer-Hartford Library. Selected reports are then submitted for publication. Following is the list of seminar projects I have personally supervised.

Analysis Of Corrosion Reactions In A Monel/70cu-30ni Joint In A Seawater Environment, C.J. Colombo, 1987

Coal Characteristics And Boiler Design, L.D. Thomas, 1988

Modeling The Thermal Behavior Of The Weld Zone During Gas Tungsten Arc Welding Of Tubing Using A Two-Dimensional Computer Simulation, K.J. Zacharias, 1988

Applications And Processing Of Superconductors, M. Ehrlich, 1988

Method For Phase Diagram Computation, J.B. Connolly, 1988

Segregation Of A Binary Alloy During Solidification, R.M. Zimmerman, 1988

Carburization Modeling And Experiment, J.H. Mutchler, 1988  
(Subsequent publication).

Mathematical Model Of Isothermal Solidification During Repair Of A Crack In A Cobalt Based Superalloy High Pressure Turbine Vane, N. Pietruska, 1988

Evaluation Of Airfoil Recrystallized Grains On A Single Crystal Turbine Stator Vane, M.Z.A. Razzaq, 1988

Basic Stress Limits In The Asme Boiler And Pressure Vessel Codes And Their Relationship To Limit Analysis, W.L. Allan, 1988

Computer Modeling Of Glass Flow During Hot Pressing Using The Discrete Particle Technique, G. Linsey, 1988 (Subsequent publication).

Equilibrium Compositions Using Solgasmix-Pv, T.G. Godward, 1989

Investigation Of Internal Transverse Cracking Of Large Diameter Monel K-500 Bar, J.J. Rowan, 1989

Comparative Study Of The Effect Of Welding Process On The Weld Structure In Titanium Alloys, J. Boettger, 1989

Using Computer Simulation To Predict The Optimal Parameters For Brazing Of A Carbide Wear Disk To An Air Hardening Steel Piston, K. Freeburger, 1989

An Evaluation Of Brazing Of Stainless Steel, D.S. Brzezowski, 1989

A Description Of The Possible Mechanisms Of Stress Corrosion Cracking In Metals With Emphasis On The Relationship With Hydrogen Embrittlement And Including A Discussion Of Related Failures, R.L. Cresman, 1989

The Effect Of Matrix-Fiber Thermal Expansion Mismatch In Metal Matrix Composites, S.E. Bergquist, 1989

Stress-Strain Relationships Based On Continuum Mechanics And Microstructure, G. Di Francesco, 1989

Materials And Manufacturing In The Nuclear Industry, P.I. Wengloski, 1989

Evaluation Of Reinforced Carbon/Graphite Fiber-Epoxy Resin Composite Turbine Rotors For Air Cycle Cooling For Controlled Environment In Commercial Commuter Aircraft, P.J. Bulgajewski, 1989

Material Factors In The Improvement Of Total Hip Arthroplasty, S. Szabo, 1990

The Origin Of Separate Nucleation Of Grains In Directionally Solidified Castings, K.E. Taylor, 1990.

A Study On Soldering And Solderability Of Cu-Base Alloys, V.B. Patel, 1990

Silicon Carbide Fibers For Cast Metal Matrix Composites, A. Marzullo, 1990 (Subsequent publication).

Cutting Of Light Metal Alloys, L.A. Rosen, 1991

Dislocation Networks In The Gamma-Gamma Prime Interface Of Nickel-Base Superalloys, J.P. Sullivan, 1991

Some Applications Of The Sem In Materials Engineering, Y. Torban, 1991

Wear Behavior Of Coated And Uncoated Cemented Carbide Inserts During Cutting Of Sae 52100 Bearing Steel, T.A. Marsh, 1991.

High Speed Machining Of Inconel 718, D.W. Longworth, 1991.

Lobing In Centerless Grinding With Particular Emphasis On Shoe Centerless Grinding, C. Bassford, 1991.

Investigation Of The Self-Propagating High Temperature Synthesis (Shs) Process, T.F. Crane, 1991 (Subsequent publication).

Disposal Of Non-Radioactive Medical Waste By Incineration, K. Lepore, 1992.

Transient Temperature Distribution In A Cylindrical 3-Region Nuclear Fuel Rod, J.D. Leiker, 1992.

Relaxation Method For The Iterative Numerical Solution Of Laplace's Equation In Three Dimensions Subject To Dirichlet Boundary Conditions, A.J. Bocchino Jr., 1992.

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The Microstructural Characterization On Hastelloy X And C101 When Laser Machined At Various Power Levels Using Three Assist Gases, T.F. Smith, 1992.

The Effect On Solderability Due To Intermetallic Growth On 60/40 Solder Coated Copper Leads, R.F. Miller, 1992.

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The Development Of Nb-Ti Superconducting Wire For The Dipole Magnets Of The Superconducting Supercollider, P. Valaris, 1992.

Numerical Analysis Of The Self-Propagating High Temperature Synthesis (Shs) Of A Titanium Carbide Cylinder, S.B. Garrison, 1992.

Material Selection In The Design Of Piping Systems And Associate Components In A Seawater Environment, S.C. Whitecar, 1992.

Electronic Properties Of Diamond Thin Films, J.B. Schneider, 1992.

Monitoring The Development Of Failures In The Raceways Of Rolling Contact Bearings, M. Korach, 1992.

Strengthening Of Composites By Shape Optimization Of Discontinuous Fibers J. Cameron, 1993.

Justification And Specification Of An Automated Packaging System For Racked Test Tubes, T.M. Shackett, 1993.

Cathodic Modification Of Nickel Electrodeposits By Noble Metal Additions, G.M. Lomasney, 1993.

Short Term Corrosion Evaluation Of Coated Aluminum Using Electrochemical Impedance Spectroscopy (Eis), W.R. Schultz, 1993.

Modeling Creep Of Superalloys, D.M. Hambrick, 1993 (Subsequent publication).

Pollution Abatement In The Petroleum Refining Industry, J. Cimusz, 1994.

Nitinol: A Shape Memory Alloy, D. Bialecki, 1994.  
The Invar Alloys: Properties, Applications And Theory, Francis  
E. Spencer Iii, 1995.

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Enhancement, Bryan C. Barbera, 1995.

Overview Of Explosion Welding, Douglas A. Bailey, 1995.

Electron Beam Welding Nickel-Based Superalloys, Michael J.  
Bruskotter, 1995.

Accuracy of a Finite Element Model in Unsteady Heat Conduction, Paul  
V. Kershaw, 1996.

The role of Gamma Prime in Nickel-Base Superalloys, Stuart Kozan,  
1996

Laser Deposition Technology, Dorothea Carraway, 1996

Laser Cutting, Sean Hurley, 1996.

High Cycle Fatigue; An Overview Focusing on the Aircraft Industry,  
John Danielsen, 1996.

Evaluation of the Effects of Key Waste Water System Operating  
Parameters on the Performance Efficiency of Filter Systems, James  
Droney, 1996.

A Parametric Study of Compressor Abradable Seal Manufacturing by  
Plasma Spray Processing, Michael Carey, 1997.

Development of Thermal Finite Element Model of Continuous Steel  
Casting Process, James Cassidy, 1997.

Optimal Design and Material Selection of Grid Fingers for Breweries,  
Kris Kolstad, 1997.

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Optimization, Oscar Abriles, 1997.

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Carrier Heat Shield Tiles, Joseph Zucco, 1997.

A Review of Hot Corrosion Coating Repairs and Turbofix of Wide-Gap Cracks on Turbine Airfoils, Anthony Pietroniro, 1997.

Adhesive Bonding of Aluminum and Stainless Steel and the use of Finite Element Modeling to predict Low Temperature Thermal Stress Fracture, Durwood Beringer, 1997.

Rapid Solidification Processing of Amorphous Alloy Braze Foils, Edward Szela, 1997.

A Thermo-Elastic Analysis of a Continuous Casting Model, Scott Moeller, 1997.

Heat Transfer Finite Element Analysis of Continuous Copper Casting and Copper Mold, Kevin Didona, 1997.

Stress Analysis of a Flywheel Disc, Bruce Paradise, 1997

Finite Element Analysis of a Belleville Washer, Paulo Coit, 1997.

Pure Conduction Analysis of melting in Cylindrical Coordinates, Scott Ingalls, 1998.

Thermomechanical Fatigue of Tin-Lead Eutectic Solder Joints in Surface Mount Devices, Patrick Clavette, 1998.

Transient Liquid Phase (TLP) Bonding: An Overview of the Process and Application to Superalloys, Beth Abriles, 1998.

Start up Characteristics of an Unlubricated Journal Bearing, Kevin Grubb, 1998.

Effectiveness of Conformal Coating as a Moisture Barrier for Plastic Encapsulated Microelectronic Devices, Francis X. Edwards, 1999

Comparison of an Indentation Hardness Force Model to Sliding Friction Theory in the Turning of Inconel 718 with Polycrystalline Cubic Boron Nitride, Alex D.Y. Wong, 1999

Trim Balancing of Turbomachinery, William J. Lesko, Jr, 1999

A comparison of a Finite Element Solution with the Error Function Solution for Selected Heat Conduction Transients, John E. Duffy, 1999

Transient Heat Conduction in an Ultrasonic Transducer Using the Finite Element Method,  
James F. Sheehan, 1999

Condition Assessment of Rolling Element Bearings, Richard J. Harry,  
1999

Investigation of the Process Variables that Effect the Bond Strength of Light Cure Acrylic Adhesives, Christopher Verosky, 2000

Mathematical Modeling of High Temperature Synthesis of TiN, Samuel A. Maeby, 2000

Improved Integrated Design and Analysis Procedures for the Creation of a Cooled Turbine Vane, Karl Radtke, 2000

Numerical Analysis of the Non-linear Dynamics of the Van der Pol Oscillator,  
Michael S. Farrell, 2000

Project Management Task Generator Tool for Information Technology Design for Six Sigma - DFSS Wizard, Jacquelyn A. Holohan, 2001

Window Functions in FFT Analysis, Andrew Retsema, 2001

Simulation Analysis of Drilling Cell, Lynn M. Boy, 2001

The Risks of Lead Projectiles in Ammunition Versus that of Alternative Projectile Materials, Maria Arceo Herring, 2001

Transient Heat Loss from an Insulated Pipe using the Inverse Heat Conduction Method,  
Jonathan M. Dentch, 2001

Evaluation and Redesign of CBS assembly using DFM techniques,  
Nilang Dalwadi, 2001

Investigation of Digital Signal Processing Algorithms for the Creation of A Spectral Peak Hold, Peter J. Maffei, 2001

Process Modeling of Aircraft Engine Testing, Michael C. Kingsley, 2001

Florida Citrus Company Concentrate Line Simulation, Marcia S. Moustafa, 2001

Transformation Toughening of Brittle Materials, Chris Vargas, 2001

Evaluation of a DePuy Acromed Manufacturing Cell using Simulation Modeling,  
Robin L. DiNardo, 2002

Modeling Studies of a Job Shop Layout, Lee Drozdenko, 2002

Quality Skills Self-Assessment and Development Program, David P. Harnois, 2002

Simulation of a Turbine Disk Manufacturing Cell, Christian A. Whitney, 2002

An Overview of Passenger Cable Lift Technology used at Ski Resorts, Joseph Ortoleva, 2002

Determination of Validity of Elasticity and Linear Finite Element Methods as Applied to a Cantilevered Beam with a Concentrated End Load, Matthew Olander, 2002

Estimation of the Effective Transient Surface Heat Fluxes on a Body, Johnny A. Collado, 2003

Analysis of A/D Converter Signal Resolution and Quality in Digital Meter Applications, Samuel Kim, 2003

Failure Analysis of an Investment Cast Nickel Superalloy Gas Turbine Engine Component, Joseph J. Liberti, 2003

Discrete Event Simulation of Cellular Manufacturing System in Jet Engine Component Repair Facility, Jacek R. Spsychalski, 2003

Modeling/Simulating and Performance Analysis of The Build of a Jet Engine, Aric Yurko, 2003

Alternate Approach for Predicting Pressure Distributions on an Airfoil,  
Sean P. Zamora, 2003

Manufacture of Injection Molded Composite Automotive Engine Intake  
Manifolds,  
Alpha Y. Tang, 2003

Topics in Self-Powered Controllers, Jason E. Harmon, 2003

Analysis of Propulsion System Efficiency due to the Impact of Turbine  
Blade Roughness,  
Eric Heims, 2003

Sensitivity Studies using a Mathematical Model of a Thin Slab  
Continuous Caster,  
Anya Brunschwig, 2003

Analysis of a Facility Layout Problem, Sergio P. Deana, 2004

Solid State Metal Joining: Cladding by Explosive Welding, Daniel Ward,  
2004

Investigation of the Effects of Nd:YAG and ArF Lasers on Ophthalmic  
Tissue, Jennifer Hoover, 2004

Shape Memory Alloy Rotating Shaft Coupling, Scot Webb, 2004

Finite Element Analysis of Thin Slab Casting, Jennifer Marckesano,  
2004.

Finite Element Analysis Method and its Application in Evaluating  
Stress-Strain Characteristics, John Mubeezi, 2004.

Design of Experiments Approach to Improve Fuel Cell Thermal  
Management System Prime Time, Steven Kotso, 2004.

Use of a Packed Chemical Bed as a Gas Coalescer in Microgravity, Erin  
McCleave, 2004.

A Comparison of the Numerical Solution of the Blasius Equation for the  
Laminar Flow over a Flat Plate, Samuel Velazquez, 2004.

Solar vs Conventional Fuel Water Desalination: A study of Competitive  
Economics, Peter Corliss, 2004.

A Comparison of the Effective Hardness of Carburized and Nitrided Surfaces to predicted Values from the Bhattacharya-Nix Finite Element Model, Keith Brooky, 2004.

Custom Furniture Making: An analysis of techniques and business practices and their effect on running a successful woodworking business, Charles Falzarano, 2004.

Topics in Vibratory Stress Relief of Weldments, Michael Robbins, 2004.

Lean Manufacturing and Discrete Event Simulation, Brendan Flynn, 2004.

Diffusion of Chemical Vapor Deposition Aluminide Coatings in Nickel Based Superalloys, Bryan Baker, 2004.

Control Optimization of an Air to Air Heat Exchanger Used in the Application of Gas Turbine Bearing Cooling Air, Charles Clothier, 2004.

A Numerical Study of Thermal Gradients Between Effusion Cooling Holes, Michael J. Murphy, 2004.

Optimization of a Diesel Engine Rocker Arm Using Finite Element Analysis to Minimize Rotational Mass, Brian Ruggiero, 2005.

A Comparison of Methods for Prediction of Residual Stresses in Thick Homogeneous and Graded Coatings, Bennett P. Collier, 2005. (3 credit Project).

A Study for the Reliability and Maintainability Performance of Two Helicopter Cockpit Instrument Configurations, Keith Alan Oatis, 2005. (3 credit Project).

Stress Analysis of an Elliptical Pressure Vessel under Internal Pressure, Jonathan C. Wang, 2005.

3-Spool and 2-Spool Turbofan Comparison for Large Commercial Applications, Edward C. Fichtner.

An Overview of Hydrogen Polymer Electrolyte Membrane Fuel Cell Technology, Stephen K. Spencer, 2005.

Optimizing Copper to Copper Contact Performance in Marine Battery Disconnect Switches, Eric J. Graham, 2005. (3 credit Project).

A Finite Element Model for Stress Analysis of Wavy Unidirectional Fiber Composites Subject to tensile Loading, Christopher S. Puzio, 2005. (3 credit Project).

A Study of the Large Deflection of Circular Plates under Transverse Loading, Bryan Siewert, 2005.

Supply Chain Transformation by Group technology at Aero Precision Company, Catherine Beltran Santiago, 2006.

Thermal Influence of Cutting Tool Coatings on Tool Life during Orthogonal Turning Processes, John W. Navan, 2006.

Evaluating a Moving Line through Discrete Event Simulation, Francisco Jose Robles-Cedeno, 2006.

Performance Improvement of a Manufacturing Cell using Discrete Event Simulation, Joseph C. Nold, 2006.

An Analysis of Thermoelastic Deformations of Plates under Localized Sources of Heat, Alison L. Aery, 2006.

A Study to Improve the Brazing Process of a Circuit Breaker, Celine McGee, 2006. (3 credit Project).

A Finite Element Analysis of Thermomechanical Deflections in the Solidified Shell of Compact Strip Process (CSP), Kaliya Balamurugan, 2006. (3 credit Project).

Effects of Varying Pressure and Heat-up Rates on the ASME Code Stress Evaluation for a Nuclear Power Plant Pressurizer Manway, Donald M. McNutt III, 2006.

Theoretical Aspects of Squeeze Film Dampers in Rotating Machinery, Christopher A. Greco, 2006.

Trajectory Analysis for a Mission to Pluto, Gustavo E. Garcia, 2006.

An Overview of Thermal barrier Coatings with Emphasis on their Failure Mechanisms, Joseph C. Birritteri, 2006.

A Parametric Study of Coating and Sheet Metal Thicknesses through Ansys Element Validation, David J. Hyland, 2006.

Finite Element Modeling of a Continuous Casting Process, Mark Ronski, 2006.

Solution of Inverse Heat Conduction Problem, Ismar Lasic, 2006.

Vibration and Chatter Analysis using Third Wave Systems AdvantEdge, David Singletary, 2006.

Finite Element Simulation of Chip Formation for Orthogonal Turning of Ti-6Al-4V, Chung-Han Liou, 2006.

Contact Cooling Optimization for Electrical Protection and Distribution Products, Andrew J. Crabtree, 2006.

A comparison of the Modal Response of Pressurized Circular and Non-Circular Ducts, Douglas Blake, 2006. (3 credit Project).

Evaluation of Deterioration of the Aircraft Electrical Wiring System due to Undetected Arcing Events, Hau T. Bui, 2006. (3 credit Project).

Property Investigation and Characterization of a Selectively Laser Sintered Aluminum Alloys, Angelina Cheung, 2006. (3 credit Project).

A Study of Steady and Time-Dependent Thermo-Mechanical Stresses in Isotropic and Functionally Graded Simply Supported Plates, Stephen Cicalone, 2006. (3 credit Project).

Spall Progression Test for Gas Turbine Main Bearings, Frances M. Figueroa-Rodriguez, 2006. (3 credit Project).

A Study of Processing and Characteristics of Titanium-Aluminum Laminates for Advanced Heat Exchanger Applications, Carmen L. Gonzalez Camacho, 2006. (3 credit Project).

Numerical Analysis of Heat Conduction and Phase Transformation in a Steel Slab Irradiated by a High Energy Density Laser, Eric Rogers, 2006. (3 credit Project).

A Study of the Dynamic Response of a Planetary Gearbox in a Turbofan Engine, Eric F. Stamper, 2006. (3 credit Project).

Analysis of Waterhammer in a Piping System, Kristen Niforos, 2006. (3 credit Project).

Studies of Fully Developed Laminar Flow and Convective Heat Transfer between Plates and Through a Tube, Barbara R. Baron, 2006. (3 credit Project).

Design Considerations for Cavitation in Aircraft Gas Turbine Engine Fuel Pumps, Jennifer X. Elder, 2006.

A Study of The Bolt Hole Resistance Weld Repair Process, Philip Scala, 2006.

Carbon Sequestration: Storage of Anthropogenic Carbon Dioxide in Geological Formations, Darek Dziubinski, 2006.

Thermal Deformation of Optical Mirrors Fabricated from Near Zero Expansion Materials, Todd J. Bednarek, 2007. (3 credit Project).

Aerodynamic Design Optimization of aa Transonic Compressor Rotor, Kate V. Colson, 2007. (3 credit Project).

A Study of the Evolution of Delta Phse in Inconel 718 Alloy caused by Post-Repair Heat Treatment Cycles, Allan S. Dygon, 2007. (3 credit Project).

Stress Analysis of Carbon Fibre Reinforced Polymer Matrix Composite Plates and Laminates containing Circular Holes, Yafet Girma, 2007. (3 credit Project).

Analysis of Machined Belows for High temperatures and Pressures Applications, Jorge E. Hidalgo, 2007. (3 credit Project).

Numerical Modeling of the Mitral Valve to Show Mitral Stenosis and Mitral Regurgitation, Kendra Stafford, 2007. (3 credit Project).

Room Acoustic Analysis using Ansys, Andrew D. Burdick, 2007.

Buckling Analysis of a Submarine with Hull Imperfections, Harvey C. lee, 2007.

Analytical Investigation of Gas Turbine Combustion Emissions dependence on Flow Distribution, Aaron Dornback, 2007. (3 credit Project).

A Study of Constrained Pressure Vessels: A Look at the Oxygen Bottle of the US Space Suit, Michael J. Santos, 2007. (3 credit Project).

A Study of Solidification Heat Transfer of Copper using a CSP Mold, Steven Gautschi, 2007.

Analysis of Stress and Strain of Pressurized Thick Walled Cylinders, Keith A. Demarest, 2007. (3 credit Project).

Design of a Vehicle Model and Traction Control System for a Drag Racing Automobile, Matthew Donald, 2007. (3 credit Project).

Mission Analysis Based Approach to LCF in a Military Engine, Christopher Walz, 2007. (3 credit Project).

A Method of Vibration Absorption of Shafts in High Temperature Rotating Turbomachinery Applications, James D. Hill, 2007.

External Flap-Load Analysis of Subsonic and Supersonic Aircrafts, Katherine A. Knapp Carney, 2007. (3 credit Project).

Turbine Vane Gross Flow Area understanding the Method and Measurement, Tracy A. Propheter-Hinckley, 2007.

Performance Analysis of the Warren-Brayton Engine and comparison with Contemporary Spark-Ignition, Diesel and Wankel Rotary Engines, Henry, E. Voegeli, 2007.

The Effect of Secondary Crystalline Orientation on Local Stress Fields in a Directionally Solidified Nickel Superalloy, Jeffrey M. Jacques, 2007.

Stress Analysis of a Functionally Graded Hollow Cylinder subject to Axis-symmetric Steady-State Loads ,  
B. A. Nelson, May 2008

Analytical Modeling of Edge-of-Contact Stresses due to Sliding Contact as it Varies with Friction, Fidelity of Model and Stress Relievers,  
M. Forcier, May 2008

A Comparison of the Predicted Mechanical Behavior of Lug Joints using Strength of Materials Models and Finite Element Analysis  
C.A. Stenman, May 2008

High Speed Tapered Roller Bearing Stress Optimization  
B. Walker, May 2008

Uncertainty in Plasma Sprayed Thermal Barrier Coating Life  
K. Mentz, May 2008

Optimization of Reinforcement Methods for Non-Round Pressure Vessels

(Master's Thesis) S. McMahon, May 2008

A Study of a Combined 2D Axis-symmetric and 3D Cyclically Symmetric

Finite Element Model of a Turbine Disk

E.A. Davis, May 2008

Velocities, pressures and Temperature Distributions near a Stagnation Point in Planar Incompressible Laminar Flow

(Engineering Seminar) E.D. Kaufman, May 2008

Stress Analysis of Cylinders with Transitioning Diameters

(Engineering Seminar) K.L. Corcoran, May 2008

Helicopter Stub Wing - Finite Element Modeling

B. Chukrallah, May 2008

Steady State Heat Transfer of a Flat Plate with Cooling Hole in a High Temperature Environment

K. Vu, May 2008

Dependence of Fracture Toughness of Ceramic Thermal Barrier Coatings on Microstructure

D.T. Tran, June 2008

Prediction of Reed Switch Operation with a Finite Element Magnetic Field Model

B. M. La Barge, August 2008

Small Channel Heat Transfer for Airfoil Cooling Applications

(Engineering Seminar) M. Palumbo, August 2008

A Study in Spur Gear Scoring

A. Amador, August 2008

Pressure Drop Comparison Study

A.H. Towne, August 2008

Fluid Velocity Amplification about Horizontal Axis Wind Mills

D.J. Aloï, December 2008

Analysis of Planing Hydrodynamics using Computational Fluid Dynamics

N.D. Barnett, December 2008

Estimation of Crack Opening Displacement and Leak Rates through

a Through-Flaw in Aerospace Pressure Vessels  
C. Bonn, December 2008

An Investigation into Improving the Efficiency of Maple Syrup  
production  
D.E. Halko, December 2008

Vibratory Analysis of Turbomachinery Blades  
M. Hassan, December 2008

Energy Approach to Damage Mechanics for Ti-6Al-4V  
D.J. Hawes, December 2008

Numerical Study using FLUENT of the Separation and Reattachment  
Points for Backward-Facing Step Flow  
L. Jongebloed, December 2008

Modeling Contact of Two Parallel Cylinders  
P.J. Loisel, December 2008

Optimum Performance of Cutting Edges in Hacksaws  
J. T. Novak, December 2008

Frequency Response Cyclic Stress Prediction in Bolted Joints  
B. Petrarca, December 2008

Elastic-Plastic Behavior of a Cylinder subject to Mechanical and  
Thermal Loads  
P.P. Poworoznek, December 2008

Stress Concentration Factor Convergence Study of a Flat Plate with an  
Elliptical Hole Under Elastic Loading Conditions  
D. Snowberger, December 2008

Contact Stress Concentration due to Surface Irregularity in  
Cylindrical Rolling Element Bearings  
J.A. Scarcella, December 2008

c. **Doctoral**

- 1) Thesis Supervisor  
(After listing these, ad number of theses in which you  
participated as a committee member).

None. No PhD program or students at Rensselaer-Hartford.

1a) Thesis Examination Committee

Heat Transfer Modeling in Thin Slab Casting of Steel  
Julian Montes, PhD, Metallurgical Engineering,  
CINVESTAV-Salttillo, Mexico, October 2008

Fluid Flow and Mixing in Pachuca Tank Reactors  
Esperanza Rodriguez, PhD, Metallurgical Engineering  
CINVESTAV-Salttillo, Mexico, October 2008

Fluid Dynamics of Secondary Cooling Air-Mist Jets  
Irma Hernandez, PhD, Metallurgical Engineering  
CINVESTAV-Salttillo, Mexico, October 2008

### **C. Course and Curriculum Development**

Between 1987 and today I:

taught more than 80 courses

conceived, developed and delivered more than 30 distinct new courses

taught about 10 course overloads;

taught 5 courses in an academic exchange with Trinity College

taught courses on site and via distance education

taught intensive short courses abroad.

In 1991 I was assigned primary responsibility for curriculum developing and course teaching of the new “Graduate Certificate in Pollution and Waste Prevention in Manufacturing” . During the first 3 years of the program over 40 students completed the four required courses and almost 200 students took at least one course. Many of these students later used the credits to pursue their degrees at Rensselaer

In 1996 I was assigned to carry out an exploratory investigation of the potential market for a new Graduate Certificate in Manufacturing Engineering Management. A proposed curriculum was developed and refined with feedback obtained from CT manufacturing companies. Preliminary results were encouraging but not definitive so the decision to start the program was put on hold.

From 1996 to 1998 half of my course load was assigned to the Lally School of Management.

In late 1998 I was assigned to explore the potential of expanding the presence of the DSES department in Hartford. A proposal to offer two new Graduate Certificates (Quality and Reliability Engineering and Systems Modeling and Analysis) was developed by the head of DSES at Troy and I have been investigating the possibility of breaking into the untapped market represented by the Insurance, Financial, Banking and other service industries.

I was actively involved in the development of new curricula for all of our new Master of Engineering degrees. I was directly responsible for developing specific content for the Mechanical Engineering degree. The new curriculum has been offered since Fall 2004. Students seeking this degree constitute the largest proportion of students within the Department of Engineering and Science.

I was involved in the process of developing a new cohort program for United Technologies Corporation in the general area of Product Quality and Process Certification. The end result of that effort was our flagship IPM Cohort Program being offered since 2007. I have developed and presented a new course in Statistical Methods in Reliability Engineering as part of this program.

I have participated in the creation and operation of cohort groups pursuing the Master of Engineering in mechanical Engineering degree for General Dynamics-Electric Boat in the Groton campus.

I have been offering MANE-6980 Engineering Project in a 15-week, 3-hr long, classroom meeting format where I lead, coach and advise groups of students working in their culminating experience for the degree.

#### IV. **Publications**

##### A. **Books, Monographs**

(Give title, co-authors if any, publisher, date. State if a contributing author to an edited compilation)

Mathematical Modeling of Rapid Solidification, Chapter 1 in Rapid Solidification Technology: An Engineering Guide, T.S. Srivatsan and T.S. Sudarshan (eds), Technomic Publishing Co., Lancaster, 1993, pp. 3-70. ISBN 0-87762-926-9.  
(Contributing invited author).

##### **Articles**

(Give title, co-authors if any, journal, volume, issue, date, paging. List spin-offs (i.e., publications essentially on same piece of work) from a major work under the major item. Provide copies for at least the past six years of all journal articles, abstracts, and book reviews if they are not already with the department file. This list should also contain articles accepted but not yet in print and those submitted and not yet reviewed.

**In refereed journals** (articles which are reviewed by peers in the field prior to publication.)

“A Mathematical Model of the Planar Flow Melt Spinning Process,” Metallurgical Transactions B, Vol. 17B, 1986, pp. 695-703. Coauthored with J. Szekely.

“A Mathematical Model of the Liquid Dynamic Compaction Process, Part I: Heat Flow in Gas Atomization,” International Journal of Rapid Solidification, Vol. 4, No. ½, 1988, pp. 89-124. Coauthored with E. Lavernia, J. Szekely and N. Grant.

“A Mathematical Model of the Liquid Dynamic Compaction Process, Part II: Formation of the Deposit,” International Journal of Rapid Solidification Vol. 4, No. ½, 1988, pp. 125-150. Coauthored with E. Lavernia, G. Trapaga, J. Szekely, and N. Grant.

“A Mathematical Model of Laser Surface Hardening of Steel”, Journal of Heat Treating, Vol. 7, 1989, pp. 19-25.

“A Mathematical Model of the Spray Deposition Process,” Metallurgical Transactions A, Vol. 20A, January 1989, pp. 71-85. Coauthored with E. Lavernia, G. Trapaga, J. Szekely, and N. Grant.

“Precipitation and Excess Solid Solubility in Mg-Al-Zr and Mg-Zn-Zr Processed by Spray Atomization and Deposition,” Materials Science and Engineering, Vol. A132, 1991, pp. 119-133. Coauthored with E.J. Lavernia and J. Baram.

“Integration of Symbolic Computation in Core Engineering Courses,” The Journal of Computing in Small Colleges, Vol. 9, No. 2, 1993, pp. 186-193. Coauthored with D.J. Ahlgren.

“Analysis of the Thin Slab Continuous Casting Process, Part I Heat Extraction and Solidification”, Metallurgical and Materials Transactions B, 35B, June 2004, 541-560. Coauthor

“Analysis of the Thin Slab Continuous Casting Process, Part II: Effect of Operating and Design Parameters on Solidification and Bulging” , Metallurgical and Materials Transactions B, 35B, June 2004, 561-573. Coauthor.

“Effect of Operating Conditions of Air Mist Nozzles on the Thermal Evolution of Continuously Cast Thin Slabs”, Canadian Metallurgical Quarterly, Vol. 47, No. 2, 2008, pp. 187-204. Coauthor.

### **In refereed conference proceedings**

“Heat Flow Behavior During Spray Deposition of Ni-base Superalloys by Liquid Dynamic Compaction,” Progress in Powder Metallurgy, Vol. 43, Metal Powder Industries Federation, Princeton N.J., pp. 683-710. ISBN 0-9184004-73-8. Coauthored with E. Lavernia, J. Szekely, and N. Grant.

“Heat Transfer and Solidification Behavior During Spray Atomization and Deposition of Low Carbon Steels,” Modern Developments in Power Metallurgy, Vol. 19, Metal Powder Industries Federation, 1988. Coauthored with E. Lavernia and G. Trapaga.

“A Mathematical Model of the Strip Casting Process,” in Proceedings of an International Symposium on Casting of Near Net Shape Products, Y. Sahai et al. (eds); The Metallurgical Society, Warrendale, PA, 1988, pp. 31-38. ISBN 0-87339-079-2.

“Mathematical Modeling of the Spray Forming Process,” in Proceedings of an International Symposium on Casting of Near Net Shape Products, Y. Sahai et. al. (eds); The Metallurgical Society, Warrendale, PA, 1988, pp. 133-151. ISBN 0-87339-079-2. Coauthored with G. Trapaga and J. Szekely.

“Near Net Shape Processing by Spray Atomization,” in Proceedings of an International Symposium on Casting of Near Net Shape Products, Y. Sahai et al. (eds); The Metallurgical Society, Warrendale, PA, 1988, pp. 275-295. ISBN 0-87339-079-2. Coauthored with E. Lavernia.

“A Study of the Selective Carburization Process,” in Proceedings of An International Conference on Carburizing: Processing and Performance, Lakewood, CO; G. Krauss (ed), ASM International, Metals Park, OH, 1989, pp. 121-131. ISBN 0-871170-360-2. Coauthored with J. H. Muthler.

“Thermal Conditions and Microstructure in Ultrasonically atomized Aluminum Alloy,” in Proceedings of an International Symposium on Physical Chemistry of Powder Metals Production and Processing, St. Marys, PA; w. Murray Small (ed), The Minerals, Metals and Materials Society, Warrendale, PA, 1989, pp. 175-200. ISBN 0-87339-108-X. Coauthored with E. Lavernia..

“A Mathematical Model of High Energy Density Induced Surface Modification of Metallic Materials,” in Proceedings of the Third International Conference on Surface Modification Technologies, Neuchatel, Switzerland; T.S. Sudarshan and D.G. Bhat (eds), The Minerals, Metals and Materials Society, Warrendale, PA 1990, pp. 461-470. ISBN 0-87339-113-6.

“Computer Simulation of Glass Flow During Hot Pressing,” in Proceedings of the EPD Congress `90, Anaheim, CA; D.R. Gaskell (ed), The Minerals, Metal and Materials Society, Warrendale, PA, 1990, pp. 465-471. ISBN 0-87339-113-6.

“Comparative Study of the Effect of Welding Process on the Structure of the Heat Affected Zone in Titanium Alloys,” in Proceedings of the International Conference on Titanium Products and Applications, Lake Buena Vista, FL, Titanium Development Association, Dayton, OH, 1990.

“Mathematical Modeling of Duplex Surface Treatment of a Low Alloy Steel,” in Proceedings of the Fourth International Conference on Surface Modification Technologies, Paris, France; T.S. Sudarshan, D.G. Bhat, M. Jeandin and J.F. Braza (eds), The Minerals, Metals and Materials Society, Warrendale, PA, 1991, pp. 393-399. ISBN 0-87339-167-5.

“Computer Simulation of Droplet-Deposit Interactions in Spray Coating,” in Proceedings of the Fourth International Conference on Surface Modification Technologies, Paris, France; T.S. Sudarshan, D.G. Bhat, M. Jeandin and J.F. Braza

(eds), The Minerals, Metals and Materials Society, Warrendale, PA, 1991, pp. 665-675. ISBN 0-87339-167-5. Coauthored with D. Zeng.

“Applications of Graphics Supercomputers to Directional Solidification and Welding,” in Proceedings of the Fifth International Conference on Modeling of Casting and Welding Processes, Davos, Switzerland; M. Rappaz, M.R. Ozgu and K.W. Mahin (eds), The Minerals, Metals and Materials Society, Warrendale, PA, 1991, pp. 349-354 and 825-827. ISBN 0-87339-172-1. Coauthored with A.F. Giamei and D.E. Edwards.

“Modeling Refractory Material Production by Self-Propagating High Temperature Synthesis (SHS),” in Proceedings of the MRS Symposium on Synthesis and Processing of Ceramics: Scientific Issues, Boston, MA, Materials Research Society, Pittsburgh, PA, 1991. Coauthored with T. Crane. ISBN 1-55899-143-3

“Computer Simulation of Mold Filling Processes,” in Proceedings of the EPD Congress '92, San Diego, CA; J.P. Hager (ed), The Minerals, Metals and Materials Society, Warrendale, PA, 1992, pp. 481-487. ISBN 0-87339-142-X.

“A Simulation Based Approach to the Development of Knowledge Based Welding Rules,” in Modeling of Casting, Welding and Advanced Solidification Processes - VI, T.S. Piwonka, V. Voller and L. Katgerman (eds), The Minerals, Met. and Mat. Society, Warrendale, PA, 1993, pp. 153-160. ISBN 0-87339-209-4. Coauthored with A.F. Giamei, J.H. Cowles, Jr., M. Bruskotter.

“Transient Heat Conduction Through Dissimilar Laminae with Time-Varying Boundary Conditions,” in Proceedings of the 1993 Annual Meeting of the American Society of Mechanical Engineers, New Orleans, LA, Nov. 1993, Paper 93-WA/HT-3 pp. 1-8. Coauthored with S. Reid Hanford.

“Mathematical Modeling of Rapid Solidification,” in “Rapid Solidification Technology: An Engineering Guide,” T.S. Srivatsan and T.S. Sudarshan (eds), Technomic Publishing Co., Lancaster, 1993, pp. 3-70. ISBN 0-87762-926-9.

“Recent Developments in Welding Modeling,” in Modeling of Casting, Welding and Advanced Solidification Processes VII, M. Cross and J. Campbell (eds.), The Minerals, Metals and Materials Society, Warrendale, PA, 1995. ISBN 0-87339-297-3. Coauthored with A.F. Giamei.

“Professor Julian Szekely’s Research: The MIT Years”, in Proceedings of the Julian Szekely Memorial Symposium on Materials Processing, H.Y. Sohn, J.W. Evans and D. Apelian (eds.), The Minerals, Metals and Materials Society, Warrendale, PA, 1997, ISBN 0-87339-384-8, pp.21-31

“An integrated mathematical model of the plasma spraying process”, in Thermal Spray: Meeting the Challenges of the 21<sup>st</sup> Century, Proceedings of the 15<sup>th</sup> International Thermal Spray Conference, May 1998, Nice, France, C. Coddet (ed), ASM, Ohio, 1998,

pp. 335-340. Coauthored with J.W. McKelliget, G. Trapaga and M. Cybulski. ISBN 0-87170-659

“The Continuing Impact of the Research of Professor Julian Szekely, in Proceedings of the Szekely-Muchi Memorial Symposium on Materials Processing, Nagoya, Japan, 2001. Coauthored with J.Evans and D. Apelian.

A. Dennis, T. Scotton, T. El-Wardany, J. Irish, P. Wang and E. Gutierrez-Miravete, “Machining Process Optimization through Modeling and Simulation”, 2nd CIRP International Conference on High Performance Cutting, Vancouver, BC, Canada, June 2006.

E. Gutierrez-Miravete, "Experiences in the use of Third Wave Systems Software at RPI" presented at the Third Wave Systems User's Conference, Seattle, WA, May 15-17, 2007.

B. Baron and E. Gutierrez-Miravete, “Modeling Convective Heat Transfer under Laminar Flow of a Newtonian Fluid in Simple Geometries”, presented at the COMSOL 2007 User’s Conference, Newton, MA, October 4-6, 2007.

E. Rogers and E. Gutierrez-Miravete, “An Analysis of the Thermal Effects of Focused Laser Beams on Steel”, presented at the COMSOL 2007 User’s Conference, Newton, MA, October 4-6, 2007.

M. Crosskey and E. Gutierrez-Miravete, “A Modeling Study of Diffusion Wear of Carbide Tools in Titanium Machining”, presented at the COMSOL 2007 User’s Conference, Newton, MA, October 4-6, 2007.

B. LaBarge and E. Gutierrez-Miravete, “Finite Element Model of a Magnet Driven Reed Switch”, Proceedings of the COMSOL Users Conference, Boston, MA, October 2008

E. Kaufmann and E. Gutierrez-Miravete, “Computation of Velocity, Pressure and Temperature Distributions near a Stagnation Point in Planar Laminar Viscous Incompressible Flow”, Proceedings of the COMSOL Users Conference, Boston, MA, October 2008

P. Lankeu Ngankeu and E. Gutierrez-Miravete, “An Analysis of Plunger Temperature during Glass Parison Pressing”, Proceedings of the COMSOL Users Conference, Boston, MA, October 2008

**Other publications** (major research reports, etc.) Architects should complete a separate form (available from the Dean of Architecture) for buildings, planning projects, works of art, and exhibits of work.

“Mathematical Model of Continuous Casting of Rods Using a Mold with Non-Axisymmetric Heat Extraction,” Technical Paper A89-14, TMS, Warrendale, 1989, pp 1-6.

“Mathematical Model of Orbital TIG Welding of Thin Walled Pipes,” in Proceedings of the X Inter-American Conference on Materials Technology, San Antonio, TX; Organization of the American States, 1989, pp. 29.9-29.33. Coauthored with K.J. Zacharias. (In Spanish).

“Mathematical Model of Galvanic Corrosion in Seawater Environments,” in Proceedings of the X Inter-American Conference on Materials Technology, San Antonio, TX; Organization of the American States, 1989, pp. 4.7-4.9. (In Spanish).

“The Use of Computer Simulation in Education in Materials Science and Engineering,” in Proceedings of the X Inter-American Conference on Materials Technology, San Antonio, TX; Organization of the American States, 1989, pp. 26.7-26.11. (In Spanish).

“The Mathematical Modeling of Rapid Solidification Processing,” NASA Contractor Report 179551, Lewis Research Center, Cleveland, OH, 1986. 225 pp.

“A Library of Computer Programs for the Modeling and Simulation of Materials Engineering Systems.” Unpublished.

“MICRO: A Computer Program for Simulation of Welding Processes,” United Technologies Research Center, East Hartford, CT, Project 242479, 1990-Date.

“F2D: A Computer Program for Simulation of the Strip Casting Process,” Olin Metals Research Laboratory, New Haven, CT, Project NHT 17763, 1991- 1992.

“Development of a Mathematical Model for Simulation of Thermo-Elastic Stresses in Continuous Casting Molds,” Final Research Report, Institutet for Metallforskning, July, 1994, 52 pp. (In Swedish).

GROW Code: Theoretical Foundation and Users Guide. United Technologies Research Center, 2001.

Spanish Translation of “Basic Corrosion and Oxidation,” by J.M. West, Ellis Horwood, Chichester, 1980, 247 pp. ISBN 0-85312-196-6. Translation published by Editorial Limusa, Mexico City, Mexico, 1986. ISBN 968-18-1929-2.

Spanish Translation of “Rate Processes of Extractive Metallurgy,” H.Y. Sohn and M.E. Wadsworth (eds.), Plenum Press, New York, 1979, 472 pp. ISBN 0-306-31102-X. Translation published by Editorial Trillas, Mexico City, Mexico, 1986. ISBN 968-24-1915-8.

Spanish Translation of "Principles of Extractive Metallurgy," by T. Rosenquist, 2<sup>nd</sup>. ed., McGraw-Hill, New York, 1983, 506 pp. ISBN 0-07-053910-3. Translation published by Editorial Limusa, Mexico City, Mexico, 1987. ISBN 968-18-2144-0.

Spanish Translation of "Fluid Flow Phenomena in Metals Processing," by J. Szekeley, Academic Press, New York, 1979, 437 pp. ISBN 0-12-680840-6. Translation published by Editorial Limusa, Mexico City, Mexico, 1988. ISBN 968-18-1823-7.

Spanish Translation of "Collected Papers of Paul Bergsoe on the Metallurgical Technologies of Pre-Columbian America," various sources Commissioned by the Museo del Banco Central of Ecuador; in the press.

Spanish Translation of "Essentials of Materials Science," by A.G. Guy, McGraw-Hill, New York, 1976, 426 pp. ISBN N.A. Unpublished.

Spanish Translation of "Ternary Equilibrium Diagrams," by D.R.F. West, 2<sup>nd</sup>. ed., Chapman and Hall, London, 1982, 149 pp. ISBN 0-412-22970-6. Unpublished.

Spanish Translation of "Rates of Phase Transformations," by R.H. Doremus, Academic Press, Orlando, 1985, 176 pp. ISBN 0-12-220530-8. Unpublished.

## V. **Research Grants and Contracts**

(Give title of project, other senior investigators, starting and completion dates, amount of funding, sponsoring agency.)

### A. **Proposals approved and funded**

A Proposal To Develop A Computer Program To Analyze Thermal Processes In Welding (PI) 1989-1996, 75k, United Technologies Research Center, East Hartford, Ct  
Mathematical Modeling Of Spray Forming Of Copper Alloys (PI) 1989, 10k, Olin Corporation, Metals Research Laboratory, New Haven, Ct

A Proposal To Develop A Computer Program For The Analysis Of Strip Casting Processes (PI) 1991-1992, 10k, Olin Corporation, Metals Research Laboratory, New Haven, Ct

Development Of An Ansys-Based Computer Program For The Analysis Of Thermal Processes In Direct Chill Casting Molds (PI) 1993, 15k, Olin Corporation, Metals Research Laboratory, New Haven, Ct

Development Of A Model Of The Tapping Of Ferroalloy Smelting Furnaces (PI) 1993, 3k, Cambridge Materials Modeling Group, Cambridge, Ma

A Proposal For Modeling The Thermal Field In Continuous Casting Molds (PI) 1994, 12k, Swedish Institute For Metals Research, Stockholm, Sweden

Development Of A Mathematical Model Of Welding of Hollow Cylinders (PI) 1995, 7k, United Technologies Research Center, East Hartford, Ct

Development Of An Ansys-Based Computer Program For The Analysis Of Alloy Dispersion In Direct Chill Casting Tundishes (PI) 1996, 15k, Olin Corporation, Metals Research Laboratory, New Haven, Ct

Development Of A Mathematical Model Of Thermal Evaporation Of Ceramic Melts (PI) 1997, 7k, United Technologies Research Center, East Hartford, Ct

Development Of A Mathematical Model Of Localized Heating of Solid Cylinders (PI) 1997, 5k, United Technologies Research Center, East Hartford, Ct

Development Of Physically-based Constitutive Equation Models for Metals at High Temperatures (PI) 1999, 5k, United Technologies Research Center, East Hartford, Ct

Development Of A Mathematical Model of Inclusion Dissolution Process in Titanium Alloys (PI) 2000, 8k, United Technologies Research Center, East Hartford, Ct

Further development Of A Mathematical Model of Inclusion Dissolution Process in Titanium Alloys (PI) 2001-2005, 10k/yr, United Technologies Research Center, East Hartford, Ct

Development of a Computer-based system for prediction of Hard-Alpha Inclusion Behavior in Titanium Alloys, RPI Provost Office, Research Revitalization Program, 25k. Starting in Fall 2001-2002.

Modeling and Simulation of Machining Operations for Supply Chain Improvement, Connecticut Center for Advanced Technology, 100k, 2005-2007

Development of Finite Element Models for Thin Slab Continuous Casting Processing, Olin Corporation, 40 k, 2005-2007.

Modeling and Simulation of Metal Manufacturing Operations for Supply Chain Improvement, Connecticut Center for Advanced Technology, 100k, 2008-2010

**B, Proposals submitted and not funded with current status**

Interactive Modeling Of The Solidification Process In Complex Castings (PI) Submitted To The Connecticut Board Of Higher Education On July, 1988, 88 Pp. Not Funded.

Mathematical Modeling Of Rapid Solidification Processing (PI) Submitted To The National Science Foundation On July 1989, 25 Pp. Not Funded.

Proposal For Research On The Fundamental Attributes Of Cadmium Plating With A View Toward Substitution (PI) Submitted To The Environmental Research Institute, University Of Connecticut On March 1993, 11 Pp. Not Funded.

The Development Of A Framework For The Management Of Technological Innovation In Environmentally Conscious Manufacturing (Co-PI) Submitted To The National Science Foundation On July 1993, 10 Pp. Not Funded.

Deploying Pollution Prevention And Risk Reduction Curricula In A Small And Medium-Size Business Community (PI) Submitted To The Northeast Waste Management Official's Association On March, 1995, 6 Pp. Not Funded.

A Proposal to Develop Expertise in Modeling and Simulation of Manufacturing Processes and Microstructure and Material Properties Evolution during Processing for Supply Chain Effectiveness Enhancement. Draft submitted to CCAT on Feb. 2008. Pending.

**C. Briefly describe your current research interests**

Mathematical modeling and computer simulation of metals processing and manufacturing operations. Deterministic and stochastic simulation methodologies. Industrial ecology. Applied mathematics and computer simulation.

**VI. Editorship of Journals, Reviews of Manuscripts, Books, and Research Proposals**  
(Give organization of journals, significant items reviewed, date.)

**Book Manuscript Review:**

"Sintering: Densification, Grain Growth and Microstructure"  
by Suk-Joong L. Kang, Elsevier, approx 500 pp, 2003

"An Introduction to the Superalloys" by R. Reed, Institute of Physics, 2004

"Statistics for Engineers and Scientists", by W. Navidi, Chapter 4, Mc Graw-Hill, 2004.

**Research Proposal Reviews:**

"Development Novel Production Techniques for High Grade Nanostructured Aluminum Alloys" Proposal Number 41912-MS submitted to the Materials Science Division, Army Research Office, 2000

"Plasma Window for Electron Beam Welding", Northeast Utilities , 2001-2002

"Study on the Development of Metal Recycling by  
Waste Oxidized Fines Interacting with Liquid Iron under Imposing the

External Specific Arc Plasma and Electromagnetic Influences" for the US Civilian Research and Development Foundation (CRDF), 2003

"Plasma, Acoustical and Electromagnetic Fields during Self-propagating High Temperature Synthesis",  
US Civilian Research and Development Foundation (CRDF), 2004

"Characterization and Testing of Coated Nickel and Iron-Based Superalloys for Application in High Temperature Power Installations"  
US Civilian Research and Development Foundation (CRDF), 2004

"A Novel Nanostructural Diamond-Based Polycrystalline Composite Material"  
US Civilian Research and Development Foundation (CRDF), 2006

"Transport and Reaction Processes in Multiphase Systems", National Council for Science and Technology, Mexico, 2006.

"Studies about Procedures used to Model Wetting and Drying During Flooding of Complex Topographies", National Council for Science and Technology, Mexico, 2006.

Proposal for a New Graduate Program in Natural Resources and Energy,  
Center for Research and Advanced Studies (CINVESTAV), Saltillo, Mexico, 2007.

**Technical Paper Review:**

"Columnar-Equiaxed Transitions leading to Tree Ring Structures during VAR of Ni-based Superalloys" submitted to Metallurgical and Materials Transactions, 2001

"Investigation of Three-Dimensional Stress Fields and Slip Systems for FCC Single Crystal Superalloy Notched Specimens" submitted to the Turbo Expo 2004 conference, American Society of Mechanical Engineers, 2003

"A New Method of Prediction of TCP Phase Formation in Superalloys" by A. Bahrami et al., Manuscript EL2004-408 submitted to the journal "Materials Science and Engineering", 2004.

"Evolution of Slip through the Thickness of a Single Crystal Nickel-Base Superalloy Notched Specimen" submitted to the Turbo Expo 2006 conference, American Society of Mechanical Engineers, 2005

"A Numerical Simulation of Super-Plastic Die Forging process for Zr-Based Bulk Metallic Glass Spur Gear" . Manuscript EL2005-707 submitted to the journal "Materials Science and Engineering", 2006.

**VII. Service**

**VIII.**

**A. Service to University**

**1. University, school and departmental committees and dates for each.**

Mechanical Engineering Program Coordinator, 2005-date

Mechanical Engineering Student Faculty Advisor (~ 200 students)

Faculty Search Committee, Department of Engineering and Science, 2007.

Faculty Search Committee, Department of Engineering and Science, 2003.

RPI Re-accreditation Committee, 2002.

Governance Committee, Faculty Senate, 1992-1993

**2. Other service and administration activities.**

Coordinator, Mechanical Engineering Program, 2005-date

ME Cohort Advisor, GE-EB, Groton, 2005-date

Coordinator, Engineering Programs, DoES, 2004-2005

Coordinator, Metallurgy/Materials Certificates, 1998-date

Coordinator, DSES Certificate Programs, 1999-2004

Curriculum Chair, Metallurgy Program 1987-1998

Offered courses on site at corporate sites on demand.

Taught courses during every other summer as required during the 1987-1997.  
Developed new courses and programs targeting student demand as required.

Interim Associate Chair, Department of Engineering and Science.  
Fall 2001-May 2004.

**3. Undergraduate student advising and counseling (number and year).**

None

**4. Graduate student advising and counseling (number and year).**

Approximately 10 students per year

<u>Year</u>	<u># of Advisees</u>
2008	190
2007	140
2005	73
2004	73
2003	74
2001	50

**B. Professional Societies (Past and Current)**

(Give memberships, positions held, dates.)

American Association for the Advancement of Science (AAAS),  
American Mathematical Society (AMS),  
American Powder Metallurgy Institute (APMI),

American Society of Mechanical Engineers (ASME),  
American Society for Metals (ASM),  
American Welding Society (AWS),  
Iron and Steel Society (ISS),  
The Minerals, Metals, and Materials Society (TMS), (Local Chapter Chairman 1992-1993)  
Materials Research Society (MRS),  
National Association of Corrosion Engineers (NACE),  
Society for the Advancement of Materials and Process Engineering (SAMPE),  
Society for Industrial and Applied Mathematics (SIAM),  
Society of Manufacturing Engineers (SME),  
Society of Plastics Engineers (SPE),  
System Dynamics Society,  
The American Ceramic Society Inc. (ACS),  
The Scientific Research Society of Sigma Xi,  
American Society for Quality (ASQ),  
American Chemical Society,  
American Institute of Chemical Engineers (AIChE)  
Institute for Operations Research and the Management Sciences (INFORMS)  
University Materials Council (UMC)  
Materials Academic Advisory Board, University of Connecticut

**C. Community and Public Service**

(Give national, state, and local organizations; position held; dates.)

**VIII. Professional and Public Lectures**

(List invited and contributed papers and Lectures, giving title, organization, and dates.)

“Modeling and Simulation of Metal Machining Processing”, Invited Talk given during the 20<sup>th</sup> anniversary celebration of the Foundation of the Metallurgical Laboratory at the National University of Mexico, March 30, 2007.

Conference Participation: "Heat Transfer, Solidification and Bulging Phenomena in Continuously Cast Thin Slabs Produced by the Compact Strip Process" (coauthor) First Congress and Exhibit of the Mexican Steel Industry Mexican Chapter of the Iron and Steel Society Monterrey, Mexico , 11/22-24, 2004

Laser Materials Processing Modeling Capabilities at R@H Connecticut Center for Advanced Technology East Hartford 9/26/03 <http://www.rh.edu/~ernesto/talks/ccat.ppt>

Simulation Modeling and Analysis  
IEE-APICS Joint Hartford Chapter Fall Meeting  
Rensselaer at Hartford 10/14/03 <http://www.rh.edu/~ernesto/talks/apics01a.ppt>

"Mathematical Modeling of Health Conduction and Mass Diffusion" CINVESTAV-Salttillo, Mexico, 11/26/2004 <http://www.rh.edu/~ernesto/F2003/MMCCDM>

"Classical and Computational mechanics for Materials " CINVESTAV-Salttillo, Mexico, November 24-25, 2005, <http://www.rh.edu/~ernesto/F2005/CINVESTAV/>

"Moving Boundary Problems", Department of Mechanical Engineering, University of Vermont, Burlington, VT, Spring 2006, <http://www.ewp.rpi.edu/hartford/~ernesto/Presentations/2006/UVM/>

"Mathematical Modeling of Machining Operations", Invited Lecture on the 20<sup>th</sup> anniversary of The Metallurgy Laboratory of the National University of Mexico, Mexico City, Mexico, Spring, 2007, <http://www.ewp.rpi.edu/hartford/~ernesto/Presentations/2007/UNAM/>

"Experiences with Machining Modeling at RPI", Invited Lecture, Third Wave Systems, Seattle, WA, Spring 2007 <http://www.ewp.rpi.edu/hartford/~ernesto/Presentations/2007/ThirdWaveSystems/>

COMSOL User's Conference, Newton, MA, 3 presentations, Fall 2007, <http://www.ewp.rpi.edu/hartford/~ernesto/Presentations/2007/COMSOL2007/>

Mathematical Modeling Experiences in Graduate-level Engineering education at RPI, Invited Lecture, 20<sup>th</sup> anniversary of the foundation of CINVESTAV-Salttillo, Fall, 2008, <http://www.ewp.rpi.edu/hartford/~ernesto/Presentations/2008/>

COMSOL User's Conference, Boston, MA, 3 presentations, Fall 2008, <http://www.ewp.rpi.edu/hartford/~ernesto/Presentations/2008/COMSOL2008/>

## **IX. Honors and Awards**

(List names and dates)

Full Scholarship from the Mexican Government to pursue Graduate Studies at Massachusetts Institute of Technology, 1980-85

## **X. Sabbatical leaves, off-campus study programs, foreign professional travel**

(Dates and topics)

Sabbatical Leave at Swedish Institute for Metals Research, Stockholm, Sweden, January-August 1994

Attendance to and participation as speaker in a number of international conferences abroad (see list under conference proceeding above).

Visiting Lecturer, Department of Engineering, Universidad Iberoamericana, Summer 1998, 2003

Visiting Lecturer, Mexican Iron and Steel Society, Instituto Tecnológico de Monterrey, Monterrey, Mexico, Summer 1999, 2000.

Visiting Faculty Advisor, Universidad Iberoamericana, Summer 1999, 2000.

Visiting Researcher, CINVESTAV, Saltillo, Mexico, Summer 2001-2004

**XI. Other Activities (Consulting, Current and Previous)**

(List other relevant activities such as consulting, [include name of company and days per year], expert witness, or significant activities not included in previous categories).

United Technologies Research Center, East Hartford, CT. Consultant 40 days/yr.

Connecticut Light and Power. Consultant 5 days/yr.

Olin Metals Research Laboratory, New Haven, CT. Consultant 40 days/yr.

Connecticut Center for Advanced Technology, 50 days/yr

Other consulting 5 days/yr.

**XII. In addition to the above information include, if pertinent, concrete evidence of teaching ability and any unusual contributions to university affairs, such as curriculum advising or development, continuing education participation, etc.**

Currently advising almost 200 graduate students pursuing the Master of Engineering in Mechanical Engineering degree in the Hartford Campus. Advising activities include assistance with curriculum and course selection, academic problems and culminating project selection.

Working closely with the Marketing Department to boost enrolment in our Advanced Studies and Cohort Programs.

Actively participated in gestation and development of the Cohort Program IPM for UT-PW. Intimately involved in curriculum development and teaching.

I also oversee the workings of the Graduate Certificate in High Temperature Materials Technology, a program consisting of three, carefully selected, subject-related electives leading to a Graduate certificate concurrent with the Master's degree.

Certificate Program In Pollution And Waste Prevention In Manufacturing Offered On Request, On-Site To Employees Of The Hamilton Standard Division Of United Technologies Corporation, 180 Hours Of Instruction , From Fall 1991 Through Fall 1992.

Certificate Program In Environmental Management, Section On On-Site To Employees Of The Electric Boat Division Of General Dynamics Corporation, 9 Hours Of Instruction, Fall 1995, Fall 1996, Fall 1997; 12 Hours of Instruction Spring 1998, Fall 1998.

Provided short courses on site on demand. Also, lectured via Distance Education Technology as required by the Institute.

In the time 2004-2006 I participated in the development of the new Master of Engineering in Mechanical Engineering Curriculum. This also involved the production of descriptive materials that were submitted and approved by the CT Board of Higher Education. During this time I also served as Academic and Administrative Coordinator of Engineering Programs.

During the Summer of 2005 I participated in the Working Group for the development of a new MEng in Mechanical Engineering Cohort Program focused on Structural Mechanics and Thermo-fluids for the Electric Boat Division of General Dynamics. The curriculum is in place and the program is now running successfully.

In 2005-2006 I participated in the Working Group for the Development of a New MEng in Engineering Science Cohort Program focused on Manufactured Product Quality through Process Improvement for the Pratt &Whitney division of United Technologies Corporation. The curriculum is in place and the program is now running successfully.