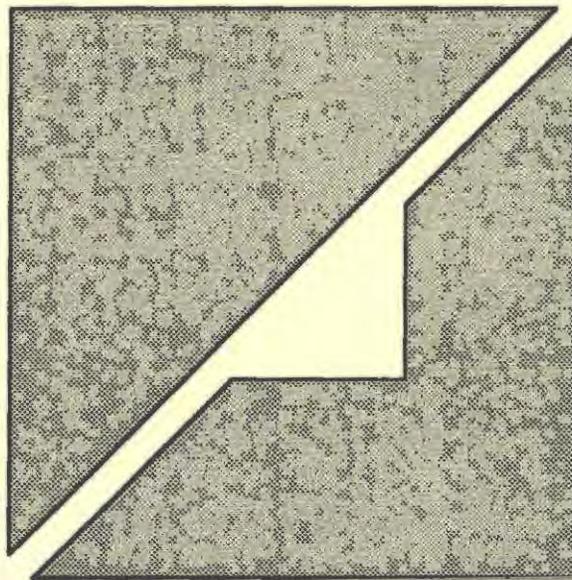


IC² Institute

The University of Texas at Austin

**CATALOG OF COURSES
and
ACADEMIC ACTIVITIES
1995-96**



BETA DRAFT March 23, 1995

IC² Institute
The University of Texas at Austin
2815 San Gabriel
Austin, Texas 78705

Since its beginning in 1883, The University of Texas at Austin has had three components of its mission: education, research and public service. Now, the University, without sacrificing any of its commitment to its traditional mission, has added another key element to its public service responsibility - the commercialization of research.

Aided by forward-thinking legislation passed by the legislature in 1985 and 1987, the University is actively encouraging the transfer of new technology to the marketplace. Through its own research arms and through its sponsorship of joint projects such as the Austin Technology Incubator, the University is smoothing the way to turn the best ideas from its laboratories into viable commercial enterprises.

These ventures, in turn, provide jobs, products and services that will help the city and the state well into the next century.

Through the leading-edge research of its faculty and students, and with the support and organization of such units as the IC² Institute, UT-Austin will be in the forefront of scientific and economic development in both Austin and the state of Texas as the 21st century approaches.

Robert Berdahl
President, The University of Texas at Austin

The next decade must be a time of cooperation and competition between different forms of market-driven economies. In the twenty-first century, shared prosperity at home and abroad must be the common goal of these economies and of national science and technology policies.

George Kozmetsky
Founder, IC² Institute
The University of Texas at Austin

**IC² Institute, The University of Texas at Austin
Catalog, 1995-96**

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The IC² Institute

Mission

The IC² Institute is a major research center for the study of Innovation, Creativity, and Capital--hence IC². The Institute studies and analyzes information about the enterprise system through an integrated program of research, conferences, and publications.

The key areas of research and study concentration of IC² include

- the management of technology
- creative and innovative management
- dynamic business development
- econometrics, economic analysis, and management sciences
- the evaluation of attitudes, opinions, and concerns on key issues

The Institute generates a strong intersection between scholarly developments and real-world issues by

- conducting national and international conferences
- developing initiatives for private- and public-sector consideration
- assisting in the establishment of professional organizations and other research institutes and centers
- maintaining collaborative efforts with universities, communities, states, and government agencies.
- operating business incubators for high technology products and companies

IC² research is published through monographs, policy papers, technical working papers, research articles, and five major series of books.

History

The IC² Institute was approved by the University administration in 1977 to study, analyze, and report on the enterprise system through an integrated program of multidisciplinary research, conferences, symposia, and publications.

The Institute grew out of a recognition by selected faculty members of the College and Graduate School of Business that the United States was undergoing a fundamental transformation. America's economic infrastructures, social institutions, and international competitiveness were changing. These changes were affecting the relationship of the public and private sectors, and were having an impact on the way business, government, and academia interacted with one another.

Understanding the scope, nature, and direction of these changes required a new type of research organization - one that could rigorously assess the impact of two key societal drivers - technology and ideology; bring new analytical methods to bear on problems affecting the nation, individual states, local communities, academia, and business firms; and evaluate issues relating to the viability of emerging industries, growth and survivability of business enterprises, and the role and purpose of private-public sector institutions.

Six characteristics distinguish the IC² Institute as a unique research organization: Dealing with unstructured problems. Developing multidisciplinary teams. Going beyond functional boundaries. Linking theory and practice more effectively. Providing opportunities to think anew within a university environment. And transferring research results to other institutions.

The Institute occupies a 12,000 square foot building about eight blocks removed from the University of Texas campus. With three floors (including an 80-seat auditorium, art galleries, seminar rooms, research offices and carrels, internal and external computer networks, satellite teleconference reception, and catering facilities) and ample parking, the installation is ideal for collaborative research, conferences and training.

The IC² Institute is a self-governing body of scholars reporting to the Office of the President of The University of Texas at Austin.

Graduate Studies Committee

Dr. Creed Abell
Dr. John Sibley Butler
Dr. Corey Carbonara
Dr. David V. Gibson
Dr. Dale Klein
Dr. Tom J. Mabry
Dr. Vijay Mahajan
Dr. Fred Phillips
Dr. Timothy W. Ruefli
Dr. Frederick D. Williams

Graduate Advisor: Dr. George Kozmetsky

Points of Contact

For information about the academic programs and activities of the IC² Institute, contact

Dr. Fred Phillips
512-478-4081
FREDP@ICC.UTEXAS.EDU

or

Dr. David Gibson
512-478-4081
DAVIDG@ICC.UTEXAS.EDU

The IC² Institute

Faculty

WILLIAM W. COOPER is the Nadya Kozmetsky Scott Fellow of the IC² Institute, and Foster Parker Professor of Finance and Management (Emeritus) in the Graduate School of Business of the University of Texas at Austin. Author or co-author of more than 400 articles and 17 books, Professor Cooper has been a consultant to nearly 200 business firms, government agencies and a dozen universities. Holder of the prestigious John von Neumann Theory Medal jointly awarded by the Institute of Management Sciences and the Operations Research Society of America he also holds the Outstanding Accounting Educator Award of the American Accounting Association, and is a Fellow of the Econometric Society and the American Association for the Advancement of Science. A recipient of honorary degrees from Ohio State and Carnegie Mellon Universities, his main interest is in modeling management and social processes.

SAMIA EL-BADRY, Research Scientist at the IC² Institute at The University of Texas at Austin, has a unique academic background in demography and economics, a business background in marketing, and an applied expertise in the driving socio-economic and demographic forces of changes in products and product usage.

After completing her undergraduate work in Psychology at the State University of New York, she worked as the director of marketing for a network of hotels in the United States and Southeast Asia. In 1983, she came to The University of Texas and earned her Ph.D. in Sociology/Demography. She worked in a consulting capacity for Technology Futures Inc., where her clients included USAID, Exxon, 3M, Kimberly Clark, McNeil Pharmaceutical and Kerr McGee.

Dr. El-Badry has performed extensive demographic studies as she has pursued a diverse range of projects. All her work has focused on strategic long-term planning based on population forces in areas including the United States, the Middle East, Japan, and Indonesia. Research areas include energy and transportation, population and policy, telecommunications, and strategic market planning.

Throughout her career, Dr. El-Badry has performed extensive research into the population and ethnic diversity of the United States. Specific US work includes studies on socio-economic attainment patterns of different US immigrant populations, a demographic examination of the Arab American market within the US, and a predictive analysis of American diversity today and its long-term future trends.

Dr. El-Badry's expertise is in population and technology forecasting as well as socioeconomic development. She is the author of numerous books and articles relating to demographic and socio-economic forces behind technological change as well as the impact of technology on society.

DAVID V. GIBSON is assistant to the director, director of publications, and senior research fellow at the IC² Institute at The University of Texas at Austin. In 1983, he

earned a Ph.D. from Stanford after completing studies in the areas of organizational behavior and communication theory.

Dr. Gibson is director of the Multidisciplinary Technology Transfer Research Group and the China Industry and Management of Technology Training Program at The University of Texas at Austin, and chair of the College on Innovation Management and Entrepreneurship, The Institute of Management Sciences. He teaches graduate courses on technology management and transfer, management of information systems, international business, managing alliances, and research methods.

Dr. Gibson's research and publications focus on the strategic management of information systems, cross-cultural communications and management, technology transfer, and the management and commercialization of technology. He had published numerous journals and his most recent books include *Technology Transfer: A Communication Perspective* (1990), *University Spin-Off Companies: Economic Development, Faculty Entrepreneurs, and Technology Transfer* (1992), *The Technopolis Phenomenon: Smart Cities, Fast Systems, and Global Networks* (1992), and *R&D Collaboration on Trial: The Microelectronics and Computer Technology Corporation* (1994). Dr. Gibson is a consultant to business and government and had made professional and keynote presentations in England, France, Ireland, Italy, Brazil, Egypt, Japan, China, and Taiwan.

GEORGE KOZMETSKY, founder and first Director of the IC² Institute, is executive associate for economic affairs of The University of Texas System. A professor in the Management and Computer Sciences Departments at UT-Austin, he holds the J. Marion West Chair in the College and Graduate School of Business, where he served as Dean from 1966 to 1982. Dr. Kozmetsky is also a professor in the Department of Medicine at the UT Health Science Center at San Antonio.

He was the first Texas recipient of the National Medal of Technology, which was awarded to him in 1993 by President Clinton. His business experience spans service, manufacturing, and technology-based industries. Co-founder, director, and former executive vice president of Teledyne, Inc., he is an expert in high technology and venture capital and serves on the boards of several other companies.

Dr. Kozmetsky is a Fellow of the American Association for the Advancement of Science. He is a charter member and has served as president of The Institute of Management Sciences (TIMS). A founder of the American Society for Macro-Engineering and president of the Large Scale Programs Institute, he serves as a special reviewer for the National Science Foundation and is a member of the American Institute of Certified Public Accountants and the British Interplanetary Society.

A member of the Advisory Panel of the Office of Technology Assessment appointed to assess the defense technology base in the United States, Dr. Kozmetsky has served both state and federal governments as an advisor, commissioner, and panel member of various task forces, commissions, and policy boards. He regularly provides special testimony on business and technology issues to state and federal legislators.

Dr. Kozmetsky's articles and papers have appeared in major professional journals, magazines, and newspapers. His most recent books are *Transformational Management* (1985), *Financing and Managing Fast Growth Companies: The Venture Capital Process*

(1985), and *Creating the Technopolis: Linking Technology Commercialization and Economic Development* (1988).

PAUL McCLURE is President and CEO of Paradigm Corporation. In the Spring of 1996 he will use his expertise in entrepreneurship and technology start-up companies when he begins teaching the course "Building the Entrepreneurial Business" as a member of the IC² faculty.

After receiving his Ph.D. in Mechanical Engineering from Colorado State University in 1972, Dr. McClure has done post-doctoral research at the University of Cambridge in England and served on the University of Texas at Austin's Aerospace Engineering and Engineering Mechanics faculty. Dr. McClure was involved with the antisubmarine warfare business with Tracor, Inc. from 1976 to 1983 and 1986 to 1987. He administered the U.T. Austin Engineering foundation from 1983 to 1986 and was instrumental in founding the U.T. Austin Center for Technology Development and Transfer.

In 1987 he founded DTM Corporation, an Austin-based company created to develop and commercialize devices that use the patented Selective Laser SinteringTM (SLSTM) process to rapidly prototype products directly from computer designs. As President and CEO for the company's first three years, Dr. McClure successfully negotiated an agreement with B. F. Goodrich company and established a strategic partnership relationship in the area of materials and process development.

At Paradigm Corporation he has provided business development consulting services to start-up and emerging companies and large companies seeking to enter new markets. Paradigm also works with professional societies, technology transfer organizations and government initiatives to bring investment capital into Texas and develop new industries.

FRED PHILLIPS is Research Programs Director and Judson Neff Centennial Fellow at the IC² Institute. Dr. Phillips is a Senior Lecturer on the University's Marketing, MSIS, and Economics faculties.

Until 1989, he was a Vice President at MRCA Information Services, a company that has led the market research industry in innovation for 50 years. His responsibilities at MRCA included corporate management and planning, consulting project management, and the design of advanced methods and applications for consumer panels. One of these was DYANATM, the market research industry's first interactive computer inquiry system for data-based consumer research.

Dr. Phillips' professional achievements and expertise are in market research, technology marketing, new product development, and strategic and innovative business use of computers. His contributions in operations research include "Phillips' Law" of longitudinal sampling, and the first parallel computing experiments with Data Envelopment Analysis.

Dr. Phillips attended The University of Texas and the Tokyo Institute of Technology, earning the Ph.D. at Texas (1978) in mathematics and management science. He has held teaching and research positions at the Universities of Aston and Birmingham in England, the General Motors Research Laboratories and St. Edward's University. He is

author or co-author of many publications in operations research and marketing, and editor of two recent books for managers, *Thinkwork: Working, Learning and Managing in a Computer-Interactive Society* (Praeger, 1992) and *Concurrent Life Cycle Management: Manufacturing, MIS and Marketing Perspectives* (IC² Institute of the University of Texas at Austin, 1990). He is a founder and member of the Advisory Board of the Austin Software Council.

WALT ROSTOW is a Senior Research Fellow of the IC² Institute. Professor Emeritus of Economics at The University of Texas, Dr. Rostow was National Security Advisor in the Johnson administration. A renowned economic historian, Dr. Rostow recently published *Theorists of Economic Growth from David Hume to the Present* (Oxford, 1990). He has written and spoken on economic growth in the Far East; two recent speeches on the topic, "Korea in the New World Order" and "Towards a New World Economic Order in an Era of Global Federalism," were published as IC² Institute working papers.

TIMOTHY RUEFLI is professor of management and former chair of the Department of Management at the Graduate School of Business of The University of Texas at Austin. An expert on corporate strategy and its quantitative dimensions, he has performed extensive data-based analyses of the relative strategies of US vs. Japanese firms in the electronics and other industries.

ROBERT S. SULLIVAN is Director of the IC² Institute. He assumed the Directorship after four years as Dean of the Graduate School of Industrial Administration at Carnegie-Mellon University. Prior to that, he was Associate Dean for Research and Academic Affairs and Joe B. Cook Professor at the Graduate School of Business at The University of Texas at Austin. He is also Sam Barshop Centennial Fellow at the IC² Institute.

Dr. Sullivan is an expert on real-time scheduling in flexible manufacturing systems, organization and implementation issues for computer integrated manufacturing (CIM), and capacity planning for CIM systems. Large scale program management is another of Dr. Sullivan's research interests. He also has an ongoing interest in service operations management and is the co-author of the first text in the area.

The first professor to win both the graduate and undergraduate awards for teaching excellence in the UT-Austin Department of Management, Dr. Sullivan is on the editorial board of *Journal of Manufacturing and Operations Management*. After completing his master's at Cornell, Dr. Sullivan volunteered for the US Peace Corps. He was selected for the first in-country training program for professionals and taught production management hand operations management at the Haile Sellassie I University in Addis Ababa, Ethiopia. He continued teaching there for four years after he completed his Peace Corps service and became active in the initial famine relief activities.

STEN THORE is the Gregory A. Kozmetsky Centennial Fellow in the IC² Institute at the University of Texas at Austin. He is a senior research scientist at the university. He also teaches in the departments of economics ("Economic change and creativity") and aerospace engineering ("The commercialization of space technology").

Since Dr. Thore joined the IC² Institute in 1978, he has been working on resource and supply systems modeling, industry logistics and the economics of high technology. He has recently published two books: a monograph entitled *Economic Logistics: The Optimization of Spatial and Sectorial Resource, Production, and Distribution Systems* (Quorum Books, Westport, Conn., 1991), and a textbook entitled *Computational Economics: Economic Modeling with Optimization Software* (The Scientific Press, South San Francisco, Calif. 1991, co-authored with G.L. Thompson of Carnegie Mellon University). He is currently completing the manuscript of a paperback titled *The Many-Splendored Engine: The Diversity, Complexity, and Evolution of High Tech Capitalism*.

Dr. Thore has authored or co-authored eight books and more than 80 research papers. His recent contributions include the development of a new constrained least squares regression technique (with applications to productivity change in the manufacturing sector), stochastic formulations of so-called data envelopment analysis (with applications involving the comparison of the efficiency of capitalism and state socialism), the pricing of heterogeneous goods (such as high technology products with many consumer attributes), and several studies of the cost effectiveness and competitiveness of the US computer industry.

Before coming to Texas, Dr. Thore held a chair in economics at the Norwegian School of Economics and Business Administration, Bergen, Norway. At this time he specialized in the optimization of bank funds management, financial intermediation, and the flow-of-funds. On various sabbatical leaves, he was a visiting professor to Northwestern University, Carnegie Mellon University, and the University of Virginia.

Dr. Thore holds the degree of *filosofie doktor* from the University of Stockholm, Sweden. He was a founding member and the first chairman of the Norway Chapter of The Institute of Management Sciences. He is a naturalized US citizen; he is also an honorary citizen of the state of Texas. He is listed in *Who is Who in the World*.

ANDREW WHINSTON is John P. Harbin Chair in Management Science and Information Systems and Director of the Center for Management Information Systems at the College and Graduate School of Business, and Senior Research Fellow at the IC² Institute. Dr. Whinston is widely published in the areas of Management Information and Decision Support Systems, and in Artificial Intelligence.

FREDERICK D. WILLIAMS is a communication professor, researcher, and author. He is director of the Center for Research on Communication Technology and Society at the University of Texas at Austin, where he occupies the Mary Gibbs Jones Centennial Chair in Communication. He served as founding dean of the Annenberg School of communications at University of Southern California between 1972 and 1985. His publications include some 75 articles and 36 books.

Williams' most recent books on topics relating to communication technology include *Research Methods and the New Media* (with R. Rice and E. Rogers; Free Press, 1988) and *Measuring the Information Society* (edited; Sage, 1988). Recent textbooks include the second edition of *The New Communications* (Wadsworth, 1988) and *Technology and Communication Behaviour* (Wadsworth, 1986). Professional management books include *Innovative Management using Telecommunications* (with H.

Dordick; Wiley, 1986); *The Executive's Guide to Information Technology* (with H. Dordick; Wiley, 1984). Popularly written trade books include *The Communications Revolution* (New American Library, 1984) and *Growing up with Computers* (Morrow, 1984), the latter co-written with his wife, Dr. Victoria Williams.

PIYU YUE is a Research Associate at the IC² Institute. She is a management scientist specializing in financial efficiency and financial economics. Dr. Yue has built a research database of the efficiencies of US and Japanese firms in many industries, and used this database to make inferences about the international strategies of these businesses.

Fellows

(All at UT-Austin unless otherwise noted)

Centennial Fellows

Creed W. Abell	College of Pharmacy
Willis A. Adcock	Dept. of Electrical & Computer Engineering
William A. Barnett	Washington University, St. Louis
William W. Cooper	Department of Management
Laurence H. Hurley	College of Pharmacy
Dale E. Klein	College of Engineering
Tom J. Mabry	Department of Botany
Robert A. Peterson	Department of Marketing
Fred Young Phillips	IC ² Institute
Ilya Prigogine	Department of Physics
Walt W. Rostow	Department of Economics
Timothy W. Ruefli	Department of Management
Rajendra K. Srivastava	Department of Marketing
Ben G. Streetman	Dept. of Electrical & Computer Engineering
Byron D. Tapley	Department of Aerospace Engineering
Gerald L. Thompson	Carnegie Mellon University
Sten Thore	IC ² Institute
Richard L. Tucker	Construction Industry Institute
Michael Wakelin	Bechtel Corporation
Andrew Whinston	Dept. of Management Science and Information Systems
John M. White (Mike)	Department of Chemistry
Frederick Williams	Center for Research on Communication, Technology and Society

Senior Research Fellows

Gerald Albaum	University of Oregon
Miroslav Benda	Boeing Computer Service
James W. Botkin	Technology Resources Group
Patrick L. Brockett	Department of Finance
R. Malcolm Brown, Jr.	Department of Botany
James C. Browne	Department of Computer Science
Helen B. Dorsey	National Center for Manufacturing Sciences
Mark Eaton	JMC Ventures
Barbara Fossum	Department of Management

Antonio Furino	The University of Texas Health Science Center at San Antonio
David V. Gibson	IC ² Institute
Stephen L. Gomes	American Technology Initiative
Prof. Kunio Goto	St. Andrew's University, Osaka
Robert D. Hisrich	University of Tulsa
J.P. Hsu	The University of Texas at El Paso
Akira Ishikawa	Aoyama Gakuin University
J.R. Kirkland	FBA Associates, Washington, D.C.
Robert L. Kuhn	New York, NY
Kenneth C. Land	Duke University
Leon Lasdon	Dept. of Management Science and Information Systems
David B. Learner	MRCA Information Services, Stamford, CT
Robert P. Leone	Ohio State University
Vijay Mahajan	Department of Marketing Administration
Hirofumi Matsuo	Department of Management
Gerhard O. Mensch	International Institute of Industrial Innovations, Germany
Kiyoshi Niwa	Tokyo University
Jesse Poore	University of Tennessee
Debra M. Amidon-Rogers	Private Consultant
Everett M. Rogers	University of New Mexico
Lorraine Segil	The Lared Group, Los Angeles
Syed Z. Shariq	NASA
David J. Skyrme	Private Consultant
Raymond W. Smilor	Kauffman Foundation
Jay M. Stein, M.D.	The University of Texas Health Science Center at San Antonio
Robert Sullivan	Carnegie-Mellon University
Delbert Tesar	Department of Mechanical Engineering

Research Fellows

Uttarayan Bagchi	Department of Management
John N. Doggett	Department of Management
Devanath Tirupati	Department of Management

Washington Fellows

The Honorable Joseph W. Barr	Former Secretary of the Treasury
Mr. Francis P. Cotter	Of Counsel, Lipsen, Whitten and Diamond
Mr. J. Richard Iverson	American Electronics Association
Mr. Philip H. Potter	Charles E. Walker Associates, Inc.
Mr. Don Fuqua	Aerospace Industries Association
Mr. John Hunnicutt	American Institute of Certified Public Accountants

Experiential Learning and Living Cases

IC² classes make use of "living cases." These are guest speakers who describe their companies' situations, share their companies' problems, and make themselves available for follow-up questions. The living cases enrich the classroom discussion, provide students with term paper topics, and provide class projects that solve real-world business problems.

We contrast "living cases" with the cases on paper that students may use elsewhere. Paper cases:

- become outdated.
- are "static," describing the firm at a single point in time.
- are often anecdotal, and do not provide the data needed for reliable inferences about management.
- provide no link to methods and tools.
- allow no recourse for asking questions spurred by reading the case.
- provide no avenue of feedback from the student to the company.

Living cases allow the student to:

- return to participating executives to ask for further relevant information.
- work with executives to develop new tools for solving the problem.
- follow further developments in the subject firm.
- interview others involved, to obtain different points of view.
- provide input in real time to the participating company, and perhaps contribute to the solution of a real, current problem.

The Austin Technology Incubator and other IC² Institute programs are a uniquely valuable setting for exposing University of Texas students to "living cases."

Academic Courses

Recommended Courses by Student's College of Enrollment

	ASE 396	MAN 386.9	IB f395	MIS 381	COM 381	LIS 387	MAN 385.36	ECO 350K 350K.1 350K.2	MKT 382	MAN 385
Aerospace Engineering	X									
Business		X	X	X	X	X	X		X	X
Communications			X	X	X	X	X			
Engineering		X	X	X	X	X	X		X	
Economics				X	X	X	X	X		
Law				X	X	X	X			
LBJ School				X	X	X	X		X	
Natural Sciences		X		X	X	X	X			
Library Science			X	X	X	X	X			

NOTE: Enroll for courses under the departmental course number included with each course description below.

MAN 385.36

Creative and Innovative Management

This course examines the theory and praxis of creative and innovative management. The course focus is on dialogue between peers to deepen the understanding of leadership and management. The current selected readings within the creative and innovative construct serve as a basis for such a dialogue. Class assignments are structured to provide opportunities to experience and develop creative and innovative management understanding and skills.

Creative management consists of: new ideas; new directions; new concepts; new methods; and new modes of operation. Innovative management consists of the ability to implement new ideas successfully and the ability to move successfully in new directions. Creative and innovative management involves the need to rethink, reshape, and restructure.

Management has evolved through a multiplicity of styles. The focus is on management as a coordinator providing leadership. It is the coupling of management tasks with new ideas, direction and modes of operation under a coordinated framework which makes it creative and innovative. It is the networking of these kinds of activities in

a communicative manner that facilitates acts of management rather than acts of an individual. Creative and innovative management involves acts of management that link together a variety of elements: organization; culture and environment; motivations and incentives; strategy; newer institutional relations; mergers and acquisitions, LBOs and networks.

The first part of this course involves understanding creative and innovative management and the process for leadership. The topics to be covered include: transformational management; nature of work in the twenty-first century; defining creativity. Theoretical perspectives include: psychodynamics of creativity and innovation; creative and innovative management; a case study on Japanese style creativity; and management and leadership.

MIS 381, COM 381 & LIS 387

Managing Alliances: Organization, Communication, and Information Technology Issues

This course (offered for the first time, Spring 1995) will explore the organizational and behavioral issues in forming and managing alliances. The course takes a multi-disciplinary perspective drawing on organization, communication and information technology (IT) theory grounded in real-world case studies. Organization issues are explored from rational, situation constrained, and emergent/random models of behavior. Communication perspectives include individual, group, and organization levels of analysis with particular attention given to the impact of advanced information technologies.

The focus is on national and international inter-organizational alliances between technology-based firms (large and small) and includes alliances across academic, business, and government sectors. The role of public-private alliances to foster regional economic development is discussed. International perspectives focus on Russia, China, Hong Kong, Taiwan, Mexico, Brazil, and Europe in general. Case studies include the emerging Austin Technopolis and other US and foreign high-tech regions, new organizational forms such as R&D consortia, and on-going IC² research projects such as the Aerospace AGILE Manufacturing Research Institute, NASA (Field Center Based) Technology Commercialization Centers, and the Japan and Hong Kong/China Internship Programs.

MIS 381 & COM 381

Technology Management & Transfer: Theory and Practice

Countries throughout the world are linking their standard of living/high value jobs to technology development. Technological advances are being driven by economic competition among public and private organizations/institutions in developed and developing nations. Concerns of military security are shifting toward economic security.

In many research organizations (e.g., federal labs, universities, R&D consortia) the value of pure research vs. economic relevance is being reassessed.

Technology transfer (TT) is the application of knowledge. Technology is essentially information. Transfer is the movement of technology via some type of channel: person-to-person, group-to-group, organization-to-organization. TT is fundamentally the communication of information that is intended to accomplish a task. TT is a particularly difficult type of communication; often it is ineffective.

TT is becoming a major management focus and involves a range of organizational, informational, and behavioral challenges to getting technology (ideas and products) from the research lab to the marketplace in a cost effective and timely manner. Organization and communication theory provides the basis for analysis and discussion of theory and case examples of technology transfer successes and failures within and between organizations.

Class discussion focuses on TT across industry, government, and academic organizations; intrapreneurship and entrepreneurship; spin-out companies; the management of TT in new organizational forms such as research consortia; and the global implications of technology management and transfer. The course will utilize established and innovative models and theories of innovation management and TT, the "living laboratory" resources of IC² Institute's Center for Commercialization and Enterprise (C²E), case studies from the Austin Technology Incubator and NASA Technology Commercialization Centers, and guest lecturers from a variety of academic disciplines and practitioners.

MIS 381, COM 381 & LIS 387

Technology Incubator Operations Program

Class is held at
Austin Technology Incubator (ATI) (794-9994)
3500 W Balcones Center Dr.
Austin, Texas 78759

The "Technology Incubator Operations Program" is an innovative, "ground breaking" course. You are asked to help shape this entrepreneurial experience for the benefit of yourselves, the ATI, and those students who will follow. This course serves as a model for other business schools in the US and globally. The course emphasizes student involvement in ATI tenant companies as "living case studies." This experience provides a richness, relevance and an "honesty" that can not be obtained from more traditional case methodologies.

Course projects focus on technology-based, entrepreneurial ventures and concern such topics as venture funding, achieving quality in a start-up, moving from research to industrial and market strength, managing structure and process in a rapidly growing environment, marketing when there isn't an established market, establishing an organizational culture management can grow with, advertising and public relations for a

start-up, do business plans predict success, are there typical characteristics of entrepreneurs, and technology transfer and management. A second focus of the course is the management of an incubator and concerns such topics as the Texas Capital Network, know-how networks, and how to enhance the success of a start-up.

The objective of the course is to maximize your educational/entrepreneurial experience through working with ATI and its tenant companies as well as benefit the operation of the ATI and its tenant companies. As your instructor, my job will be to help organize, monitor, and evaluate your performance. In the end we hope to link management/entrepreneur theory and practice to the benefit of the class participants, the ATI, and ATI's tenants.

MIS 381

Introduction to Electronic Commerce

The emergence of an electronic technology platform will have a significant impact on the way business is conducted and the types of products and services offered. Electronic commerce, which at present is in its infancy, will grow rapidly in the next few years. The course will review the growth of the Internet as the primary technology for electronic commerce. Additional topics include electronic publishing, interactive advertising, and directories, software mail enabled agents, electronic brokerage and digicash and intra-organizational electronic commerce. The course is open to graduate students.

MAN 386.9

Japanese Manufacturing Management

Japanese manufacturers have developed distinguished management philosophies, concepts, and techniques over the last thirty years. Their products are significantly superior in cost, quality, development time, and diversity to the Western manufacturers. We shall study in detail how Japanese manufacturers run their firms and why they do differently from the US practices. We shall study how responsibilities in the factory are organized, how workers are motivated to continuously improve the production processes, and why they are quick in converting technologies to new products.

This course consists of three major modules: just-in-time systems, total quality control and Japanese management of technology. In the just-in-time module, various techniques developed mainly at Toyota are introduced and analyzed. These are Kanban systems, U-shape lines, setup time reduction, Jidoka, Pokayoke, Andon, and quasi-vertical integration. The goal of this module is to provide students with techniques for improving manufacturing operations. In the second module, total quality control is addressed. We study the practice of Japanese total quality control techniques and activities such as the seven tools, Kaizen, KJ method, Taguchi method, and quality function deployment. The emphasis in this module is placed on the management of human resources related to continual improvement of production processes. The third module deals with the Japanese technology management. The time to market of Japanese manufacturers is

shorter than their Western counterparts. We analyze how to reduce the total time to shipment.

MGT 385 & MKT 382

Managing the Product Cycle: Manufacturing and Marketing Perspectives

A survey of top operation executives has shown that one of the top skills desired for incoming management employees is life cycle management. Otherwise known as concurrent engineering or product optimization, this subject encompasses “producibility” (i.e., design-for-manufacture). At a broader level, it means considering during the design/planning phase all subsequent burdens, costs and opportunities. These include manufacturing, test marketing, distribution/logistics, advertising, support and maintenance, and many other phases all the way to obsolescence and disposal. These activities occur within the product’s demand cycle (time-sales curve).

Students will review the literature of new product development and utilize the expertise of industry executives to work toward three goals: to reconcile the streams of thought about product development cycle that exist in marketing, in manufacturing/engineering, and in international trade; to develop strategies and methodologies for minimizing dollar and environmental costs and/or maximizing profits over the life cycle; and to map the organizational and information systems innovation that must be made in order to implement life cycle management in the firm and in government agencies. Emphasis is on industrial products, although the discussion will be relevant to technology based consumer products.

Topics to be covered include time-to-market issues, life cycle costing, the environmental life cycle, and product development teams. Grades will be based on class participation, a group term project, and homework assignments.

MKT 382

Incubator Laboratory-Marketing Advanced Technology

Class is held at
Austin Technology Incubator (ATI) (794-9994)
3500 W Balcones Center Dr.
Austin, Texas 78759

The course is an ATI incubator laboratory with a different perspective. We focus on the products and marketing programs of the ATI tenant companies and other local, young hi-tech firms. These are advanced products, mostly for industrial customers, and many involve long learning curves for the user. Guest speakers from these companies will present the products and the problems of developing and marketing them. We’ll look at

the special problems of market development for these products, including how the customer companies will apply the products; how customer companies will have to organize to use the products effectively; the customers' perception of risk and learning burden; and their need to change corporate culture in order to use the new technology effectively. These products are helping "create the future." We will hear the guest speakers' visions of the company of the future that has incorporated their product and is using it fully. Thus the course will involve some technology assessment, some market research, and some "science fiction writing." As a part of the IC² Institute's Japan Industry and Management of Technology (JIMT) Program, this course will also examine the technology marketing practices of Japanese firms through readings and through the experiences of local firms with a presence or with JVs in Japan. This comparative approach will indicate strategies for global technology marketing and for US-Japan marketing partnerships.

ECO 350

Economic Change and Creativity*

* In 1995 this course is taught as ECO 350K.1. See below.

ECO 350K.1

Long-Term Trends in Business Economics

This course deals with the changing nature of the US economy as seen from the vantage point of research carried out at the IC² Institute. Emphasis is placed on technological change in the communications and information industry, in the life sciences, and in transportation technology. The long term evolutionary perspectives of capitalism are discussed, and the competitiveness of US industry.

ECO 350K.2

Current Issues in Business Economics

This course is intended for seniors in the Business Economics concentration. The purpose of the course is to expose students to newly emerging problems in business and its environment, and the approaches that are being developed and used for structuring, analyzing and treating them. The problems include global competition, demilitarization, technology management, regionalization of economies, fast product cycles, and the challenge of realizing the potential of information technologies.

The course utilizes several guest speakers and instructors from the University and from industry and the public sector.

The Commercialization of Space Technology

This graduate course focuses on technological change, new products, the startup of new companies, and emerging industries in the space area, including the communications and information industry, robotics, and biotechnology. The course deals with problems of management of new ventures, the marketing of high technology products, and the economics of space technology. Drawing on the students' background in nonlinear dynamics, the course presents mathematical and programming techniques of analysis of evolving technology.

Students will become acquainted with ongoing research carried out at the IC² Institute, and incubation and the development of new enterprise under the auspices of the Institute, both at the Austin Technology Incubator and at the NASA technology commercialization centers at the Johnson Space Center in Houston and in Silicon Valley (all three incubators being operated by the IC² Institute). Guest speakers from these institutions will address the class.

Students learn how to search financial data bases (available on CD-ROM disks) for information about the sales, profits, and other vital financial statistics of US and foreign corporations. Students are taught a software package called GAMS (general algebraic modeling system) suitable for the study of evolving technology life-cycles, capital budgeting, corporate ventures, and the competitiveness of corporations.

Course number to be assigned

Building the Entrepreneurial Business

This course addresses conception, start-up and growth of technology businesses. The focus is on rationale, key processes and practical tools. Underlying principles are illustrated by case studies. Decision support tools and organization building methods are presented that help the first-time entrepreneur take control of his or her destiny and build a viable company. The subject material applies to both product and service businesses.

The course is divided into five parts. The first examines the basic rationale for establishing a business. Entrepreneurial attitudes and lifestyles are examined and personal motivations are studied in terms of risk balanced with intrinsic and extrinsic rewards. The second part identifies the full range of issues that must be addressed by a growing business and develops the elements of a business plan to address these issues. Some of these topics include how to define the purpose of the business, size and segment the market, raise capital, protect intellectual property, develop products and service delivery systems, build an organization, establish operational systems and management structures, build distribution channels, and generate sales. The third part of the course profiles the roles of key players in the start-up and growth process. The entrepreneur is characterized as a "Jack of all Trades" who must acquire the background to understand and relate to the concerns and objectives of all persons involved in an industry. In the fourth part, students are introduced to the notion that the entrepreneur must become "Master of One" trade in addition to his or her own unique professional background; namely that of organization

builder. Business plans developed by student teams will be presented in class and critiqued at the fifth and final stage of the course.

MS Degree Courses*

*The following courses are taught only through the Executive M.S. in Commercialization of Science and Technology Program.

Core Courses

380 Converting Technology to Wealth. Examines the process through which the knowledge (ideas, innovations, science, technology, talent and know-how) in the free market economy is converted to wealth. Covers the complementary asset theory, human asset investment, legal and economic valuation and risk analysis.

381 The Changing Role of Federal Technology. Reviews the current scope of federal R&D resources (brain power and infrastructure), recent technology transfer legislation and intellectual property rules and innovative experimental technology transfer programs and their impact on federal science and technology commercialization. It emphasizes the government and free-market technology acquisition, development and transfer approaches and examines the impotence of culture change, dual use technology programs and public-private collaboration in the post-cold war economy.

382 Managing the Technology-Based Product Cycle. This course develops an understanding of the forces driving competition in industrial markets, with heavy emphasis on cycles effecting technology products: demand cycle, R&D and design cycle, process cycle and global market cycle. It enhances skills in analyzing competitive trends, identifying threats and opportunities, designing new products and/or marketing strategies to best suit market conditions, customer satisfaction, monitoring competitive activities, and asserting a firm's relative advantage via competitive intelligence.

383 Technology Management and Transfer: Theory and Practice. Covers theoretical and practical perspectives, approaches and experiences in transferring technology among and between government, industry and academia, management of technology transfer processes, competitive analysis of global technology transfer experiences and approaches, a preview of emerging innovative mechanisms, models and themes and their comparative assessment.

384 Metrics and Models for Measuring Technology Commercialization Effectiveness. Designed to explore models and concepts from accounting, auditing and program evaluation to the measurement of technology commercialization effectiveness at all levels: national, regional, industry, program and project. This is a quantitative and theoretical course that draws on earlier work on DEA, chance-constrained programming and risk analysis. The course will develop and analyses metrics and models for existing

and new science and technology commercialization policies, strategies, program and project, and lead to establishment of measures of effectiveness in each case.

394 Creative and Innovative Management. Creative management deals with new concepts and ideas, new initiatives, and new methods that can be used to provide new directions or new modes of operation for organizations and activities. Innovative management focuses on the ability to successfully implement these new ideas and to move successfully in new directions. The course deals with ways of getting things done by generating creative activities and then implementing them successfully.

Technology Policy Concentration

390 Technology in the Emerging Economic World Order. Establishes the geopolitical context for exploring the changing face of market economies of the world and the emergence of various forms of capitalism. The course will link the technology frontier, economic logistics and American administrative style into a unifying foundation for comparative assessment and analysis of US technology policy in the global marketplace. This course will draw on the recent work of American, European and Japanese scholars on global policy, economics and markets.

391 Critical Technologies and Commercialization. Develops methodologies for evaluation of technology commercialization potential. The technology life-cycle concept, criteria for selection of commercializable technologies and technology commercialization risk assessment will be analyzed and applied to a list of critical technologies.

392 Regional and Community Factors for Technology Commercialization. The commercialization of technology is linked to the regional and community environment in which the technology enterprise is launched. This course will encompass a set of refined economic development case studies across a wide range of communities and concentrate on the factors critical to the success of technology enterprises. The course analyzes the importance of sociological (know-how) networks and learning communities in establishing a community's economic advantage.

Technology Enterprise Concentration

394 Technology Enterprise. Develops the strategies necessary to create and implement, and manage, technology enterprises. Factors such as risk analysis, financial strategies and market potential will be analyzed. Quality, pricing, competitiveness and operations management issues will be considered.

395 The Art and Science of Market-Driven Entrepreneurship. This course takes a multi-disciplinary approach to the study and practice of entrepreneurship. In doing so, it examines the process of creating new ventures, the dynamics of growth-oriented firms, the roles of entrepreneurs and intrapreneurs in different organizational environments, the factors that drive the entrepreneurial process, and elements necessary to preserve

entrepreneurial process, and elements necessary to preserve entrepreneurial management in a larger, growing company..

396 Technology Enterprise Design and Implementation. Students will develop a detailed, growth-oriented business plan for a technology enterprise of their choice. The course accelerates the enterprise development process by focusing on risk management, acquisition of funding for the enterprise, recruitment of key personnel, directors and consultants, and presentation skills.

Independent Study Project

Professional Report

Academic Concentrations

Japan Industry and Management of Technology

The Program

The focus of the JIMT Program is for graduate students to understand Japanese technology transfer and commercialization. In this respect JIMT conducts research, develops and teaches courses, and provides internships in Japanese firms and government laboratories. The JIMT Program's research, conferences and curriculum building promote and support the development of constructive professional relationships between the US and Japanese industry and research communities. Through educational programs held at IC² Institute, and through cooperative internship opportunities in Japan, JIMT participants increase their general understanding of Japanese society and culture and promote the development and exchange of technology between the two nations.

In response to this critical need, the IC² Institute of The University of Texas at Austin, in partnership with The University of New Mexico, developed the Japan Industry and Management of Technology (JIMT) Program. Participants receive training in the Japanese language and are introduced to the Japanese social and business context. Through contacts at multiple sites in Japan, the JIMT Program provides graduate students and professionals with intensive research internship positions in Japan, and the opportunity to study the management and business practices used by the Japanese in areas of science, engineering and manufacturing.

JIMT provides valuable and practical knowledge to professionals from industry, small firms, and government, and to graduate students, through three instructional programs:

- JIMT Workshops consist of 2-day and 3-day programs led by industry leaders and renowned educators in Japanese;
- JIMT offers 14 Semester-long Courses in Japanese Technology Management that provide in-depth instruction in both Japanese technology management and Japanese language and culture;
- JIMT internships are typically for periods of 3 months to 24 months, and provide industry professionals and graduate students with intensive research internship positions in Japan, and the opportunity to study the management and business practices by the Japanese in areas of science, engineering and manufacturing.

Eligibility

All UT students are eligible for the JIMT program, but a preference is given to graduate students enrolled in Engineering, Natural Sciences, Communications and MBAs. Graduate students with an overall GPA of 3.0 or a minimum 3.4 GPA in JIMT courses are

eligible for internships at Japanese companies or government laboratories. Students must complete five JIMT courses to qualify for internship opportunities. These courses are in Japanese language and in technology management subjects.

Students are placed in internships that match their fields of interest and qualification. Salary and housing may be paid by host companies ; however, in some cases , the intern's living expenses may be supported through other sources.

Admission

Admission to the JIMT Program is limited to students who fulfill the above eligibility requirements and who have experience and/or interest in science and technology based fields. Proficiency in Japanese and/or experience in Japan is desirable.

Course Requirements

Students must complete five JIMT courses to qualify for internship opportunities. JIMT core courses consist of:

1. two semesters of Japanese language:
 - A. JPN 506- First year Japanese I
 - B. JPN 507- First year Japanese II

2. examples of two core courses to be chosen in technology management are listed below:
 - A. MKT 382 - Marketing Advanced Technologies
 - B. IB 395 - Business in Japan
 - C. COM 380 - Intercultural Technology Transfer
 - D. MAN 385.9 - Japanese Manufacturing Mgt.

3. one elective course of the following:
 - A. JPN 325K - Advanced Japanese Conversation I
 - B. JPN 326 - Business Japanese
 - C. JPN 412K - Second year Japanese I
 - D. JPN 412L - Second year Japanese II
 - E. ANS 372 - Perspectives on Japanese Culture
 - F. BA 391 and 691 - Special Studies BA - International Business
 - G. LAW 379M and ANS 380T - Introduction to Japanese Law
 - H. LEB 380 - Protection of Technology
 - I. MAN 385 - Cross Cultural Management: International Perspective
 - J. MAN 385 - Management and Marketing in Global Arena
 - K. MAN 385 - Creative and Innovative Management
 - L. ME 397 - Robotics and Automation
 - M. MKT 382 - Buyer Behavior in Global Markets

Each student is encouraged to attend one JIMT short course. The 3-5 day courses bring the world's leading experts to instruct on Japanese technology and technology management topics. The courses are held 3-4 times per year.

In addition to the JIMT core courses, JIMT credits may be obtained for supervised independent study courses, theses, master's reports, and alternative courses in an amount depending on the relevance of the coursework to JIMT Program goals. Assignment of qualifying credit for such courses shall be determined on a case-by-case basis by the JIMT Director in consultation with the student's thesis advisor(s).

Business Economics Concentration

The Business Economics Program (BEP) is an innovative program designed to prepare the student for a successful career in a rapidly changing economic environment. The program combines an Economics major in the College of Liberal Arts with the Business Foundations Program in the College of Business Administration and capstone courses taught by the IC² Institute, integrating the skills taught in business courses with the fundamentals of economics.

The BEP builds on the fundamental principles taught in microeconomics, macroeconomics, and economic statistics. Two courses designed for the BEP --one on long-term trends and one on current issues in business economics --provide the student with the breadth and flexibility to grasp opportunities and challenges in a fast-changing world. Elective courses in applied economics permit BEP majors to develop knowledge and skills in such areas as financial institutions, computer technology, energy, international economics, regulatory policy, and taxation. Combined with the business foundation courses, the BEP curriculum prepares the student for success after graduation.

Upon completion of the program, the student will be awarded a Bachelor of Arts degree in Economics, as well as certifications in both the Business Economics Program and the Business Foundations Program. The student is required to have an area of specialization in applied economics, which will be recognized on the BEP certificate. These certificates will not be recorded on the student's transcript, but can be included in materials presented to potential employers, organizations, or other individuals. Graduates of the program will be supported by Liberal Arts Career Services, which provides career counseling and arranges interviews with prospective employers.

The highly ranked College of Business Administration is a leading teaching and research institution. The Department of Economics has renowned teachers and researchers in many fields -- including econometrics, game theory, industrial organization, monetary economics, public finance, and international economics. The Department places a high priority on quality teaching at all levels of the undergraduate program. Many senior professors teach in the BEP, starting with the introductory courses. Furthermore, the program is closely associated with the IC² Institute, a major international research center which links leading-edge scientific and technological change to business, government, and academia.

The BEP was implemented in the 1993 fall semester. Certification may be obtained at the end of any semester upon completion of all degree and BEP requirements.

Further details about the Business Economics Program should be obtained from the Department of Economics.

Degree Programs

Executive M.S. in Commercialization of Science and Technology

As the US creates more jobs and wealth, and maintains a leadership position in the world marketplace, the commercialization of federal, university and privately-developed R&D is a key competitive advantage. This career field is expanding at a rapid pace, with increasing demand for knowledgeable professionals who can actively participate in the successful transfer and commercialization of technology.

The Executive Master of Science degree in Science and Technology Commercialization offers professionals in government laboratories, federal agencies, universities and corporations the opportunity to develop and extend their skills. The two concentrations in this program - technology policy and technology enterprise - offer a choice of career paths.

The objective of the M.S. degree program is to prepare managers to better commercialize technology in the rapidly changing national and international environment, both in public and private sectors. Students will be prepared to advise government entities on technology transfer and commercialization policy; become involved in R&D and project management within federal agencies; launch their own ventures; or accelerate technology transfer through a position in science parks, incubators or commercialization centers. Successful graduates will possess the concepts, tools and knowledge to operate in and contribute to these new economic environments.

The program allows mid-level to senior executives to pursue this advanced education in conjunction with their careers. The program consists of 33 semester hours, including six core courses. (The Executive M.S. courses are listed in the "Academic Courses" section of this catalog.) Students choose a technology policy track or a technology enterprise track, each consisting of three courses. All students are required to complete an independent study project report and a professional report.

Classes meet every other week on Friday and Saturday, with one-week seminars held at the beginning of each semester.

This program will be taught in the Washington, D.C. area beginning in August, 1995. Applications are available at the IC² Institute.

The Interdisciplinary Ph.D.

Students wishing to pursue doctoral study topics that cross departmental lines may do so through the Interdisciplinary Ph.D. track of the Graduate School of The University of Texas at Austin. The IC² Institute invites qualified students interested in Ph.D. studies in industry, technology and society - and particularly in technology commercialization and innovation - to consider the Institute their home department for the UT-Austin Interdisciplinary Ph.D.

Current IC² doctoral students are researching alliances for agile manufacturing, and international contract negotiations in construction, among other topics.

Students must fulfill all requirements for admission to the Graduate School of The University of Texas at Austin, and must interview with the faculty of the IC² Institute prior to applying to the Graduate School.

The following are courses of a Ph.D. study for a student interested in aerospace engineering and marketing who entered the Ph.D. program with a prior masters in aerospace engineering:

COURSE NUMBER	COURSE DESCRIPTION
ASE 388P	Celestial Mechanics II
ASE 381P	Optimal Control
ASE 380P	Analytical Methods II
ASE 381P	Statistical Estimation Theory
ASE 396	Commercialization of Space Technology
BA 385T	Financial Management
ACC 381M	Financial Accounting Issues in Business Decisions
MAN 385	Entrepreneurship in Global Economy
MKT 382	Marketing High Tech Products
BA F391	Special Studies-BA Management
MKT 397	Marketing, Management and Strategy
IB 395	Global Business Operations
ASE 999R	Dissertation
ASE 999W	Dissertation

Students currently enrolled in the doctoral programs of other UT-Austin colleges are welcome to join the IC² study groups (see "Study Groups" below), to participate in other IC² programs, and to confer with IC² faculty concerning research issues in technology transfer, commercialization, marketing, and related topics. See "Doctoral Graduates in Technology Transfer Program" below for examples of such topics.

Student Activities

Internship programs

IC ² Internship Locations Include:	
Texas-	Austin Houston
California -	Silicon Valley
China-	Beijing Shanghai
Japan-	Tokyo Osaka

IC² Internships - Opportunities for Experiential Learning

Texas is a dynamic entrepreneurial state when it comes to domestic and global business. Exports of Texas companies' products to US and foreign customers are growing. Foreign direct investment, and the number of foreign customers present in Texas, is on the rise. Moreover, Texas is a leader in high-tech exports in the strategic industries that ensure US economic competitiveness. These include semiconductors, computers, telecommunications, software, medical technologies and aircraft.

Tomorrow's Texas Entrepreneurship depends on educated and experienced people with technical and international know-how, who appreciate the role of technology commercialization in economic progress, and have a facility for dealing with diverse world cultures.

The IC² Institute internships help graduate students enter the workforce with the skills that are essential to Texas and US business competitiveness and leadership in the new global economy.

Texas Entrepreneurship for the 21st century will require more than a "can do spirit"; it will focus on "doing and accomplishment." It will involve all the facets of entrepreneurship: small business and giant business entrepreneurship; plain entrepreneurship and technology entrepreneurship; Texas entrepreneurship and Texas global network entrepreneurship.

The IC² Institute's "think-tank" and "do-tank" divisions work on entrepreneurship in the global context. This includes studying and building new kinds of collaborative institutions, investigating technology policy options and new markets for new technologies, and encouraging intelligent economic growth based on technological innovation. Student interns assist in all these important and leading-edge activities, and

learn while they and the Institute staff *make things happen*. Interns prepare for the careers of the future by learning and doing. This is the best kind of experiential learning. That former IC² interns get good jobs is proven.

Hard work, excellent results, and useful written reports to industry are expected from all interns.

Applications for all internships may be obtained from the IC² Institute.

Austin Technology Incubator Internships

Austin Technology Incubator (ATI) interns play important roles in managing the incubator's daily operations as well as in planning and executing special projects for tenant firms since the incubator's formation in 1989.

ATI interns have the unique opportunity of being exposed to and gaining experience working with successful start-up companies.

ATI interns are typically involved in one of three aspects: management of the incubator, marketing of the incubator, and helping ATI companies prosper.

Management projects include:

- Evaluate business plans and recommend applicants for entry into ATI.
- Coordinate and oversee activities to facilitate the entry of new companies.
- Continual communication with ATI tenant companies to make sure their needs are being met.
- Manage seminars and membership of associated councils, including the Austin Software Council.

ATI interns' marketing projects include:

- Plan and conduct research on competition, new markets, distribution channels.
- Assist in development of product strategy and marketing plans.
- Implement product strategy.
- Plan and produce ATI-sponsored seminars for entrepreneurs, which expose the public to ATI and its services, as well as generate leads of potential new companies to ATI.
- Generate awareness of and attendance at ATI- sponsored seminars.

Other ATI company projects include:

- Develop and distribute press releases and promotional material.

NASA Technology Commercialization Centers Internships

The NASA Technology Commercialization Centers at Ames Research Center, California and Johnson Space Center, Houston are partnerships between NASA and the IC² Institute to transfer NASA technology to American business, thereby creating new products and services, and new jobs.

NTCC interns can be involved in this process through such projects as:

Evaluate business plans and recommend applicants for entry into NTCC.

- Coordinate and oversee activities to facilitate the entry of new companies.
- Continual communication with NTCC tenant companies to make sure their needs are being met.
- Work with NASA scientists, university professors, and industry professionals in diverse technology areas to identify and assess technologies with commercial potential.
- Conduct secondary market research using business literature, scientific journals, and financial databases to evaluate potential competitors and customers.
- Conduct primary market research, identifying and contacting competitors, customers, and suppliers.
- Work closely with entrepreneurs to create businesses based on NASA technology, and develop overall business and marketing plans.

The Capital Network Internship Opportunities

The Capital Network (TCN) is non-profit organization that provides an innovative service that matches prospective investors with promising entrepreneurial ventures. TCN is the largest nonprofit capital network in the United States and has assisted companies in raising nearly \$25 million of investments. TCN works closely with investors, entrepreneurs and related business professionals. TCN conducts a series of seminars for entrepreneurs and investors on business financing issues.

TCN intern activities include:

- Establish and maintain contacts with investors, entrepreneurs, and other organizations involved in fostering the growth of new companies.
- Plan and implement educational seminars for entrepreneurs and investors.
- Write and edit business summaries in order to generate interest among investors.
- Promote TCN by designing and distributing promotional material and press releases.
- Review business summaries for entrepreneurs.
- Set up business finance seminars.
- Market projects targeting entrepreneurs and investors.

MBA students are eligible for TCN internships. Class credit may be arranged with specific projects.

IC² Research and Publication Programs Internship Opportunities

The Institute's research and publication programs ensure that IC² is known worldwide as "the place where the ideas are." These ideas, and the global network of researchers and policy experts that generate the ideas, inform the IC² Institute's technology commercialization and economic development activities.

IC² interns may take on research and/or editorial duties.

Interns activities include:

- Organize international research conferences.
- Liaison with authors. Control publication schedules.
- Institutional research on new government/industry collaborations.
- Methodological research in management science and economics.
- Create new research alliances to meet national, state and business needs.
- Manage seminars and membership of associated councils, including the UT-Austin Entrepreneur's Council.

Japan Industry and Management of Technology (JIMT) Internship Program

United States and Texas based firms have a growing need for technically trained individuals with the knowledge and experience to function in today's international business arena. In particular, there is a severe shortage of graduates with an understanding of Japan, Japanese language, and the world of Japanese industry.

The IC² Institute of The University of Texas at Austin was selected by the US government as a site of the Japan Management Program. The Japan Industry and Management of Technology (JIMT) Program is designed to promote and to provide support for the development of professional relationships between the US and Japanese research communities, with the added aim of training a new generation of international technology managers. Through contacts at multiple sites in Japan, JIMT at the IC² Institute provides graduate students intensive research opportunities and exposure to Japanese language and culture. JIMT Internship Program students qualify for job opportunities within internationally oriented companies and organizations.

JIMT interns' activities include:

- Work with Japanese corporate and government offices and laboratories.
- Contribute to the Japanese hosts' project as an active team member.
- Work with strategic technologies and policies that are important to the US-Japan relationship.
- Make contacts that are valuable to US industry and to the students' career.
- Become knowledgeable about Japanese technology may benefit Texas and US industry.

The Program requires that internship participants complete five JIMT-designated courses in Japanese language, business, and area studies. Student interns must have completed the equivalent of two semesters of instruction in Japanese and, at least, three other courses from the JIMT recommended courses. Comparable courses may be substituted with the permission of the JIMT Program Director. In addition, students must have completed their undergraduate degree and have a point average of at least 3.0 on a 4.0 scale. Because of the emphasis placed on technology management, preference will be given to students with a scientific or engineering background.

In past years, UT-Austin JIMT students have enjoyed internships with Chiyoda Corporation, Shimizu Corporation, Weyerhaeuser Japan, Ito-Yokado, Ezake Glico, Daito Corporation, and the Oita Chamber of Commerce and Industry. Opportunities with additional companies and government laboratories will open up each year.

China Industry and Management of Technology Training (CIMTT) Program Internships

The China Industry and Management of Technology Training Program (CIMTT) at the IC² Institute offers exceptional students the opportunity to complete eight-week summer internships working in small, mid-sized, and large technology-based Chinese enterprises. CIMTT is a cooperative, innovative program which is co-sponsored in China by The University of Science and Technology, The Chinese Young Entrepreneurs' Association, and the Chinese Academy of Sciences.

CIMTT student interns' activities include:

- Work closely with Chinese students and professionals on problem-solving and project management within the Chinese host organization.
- Engage in intensive language training [for beginning and advanced students of Mandarin].
- Improve students' and host organizations' cultural awareness and international business skills.
- Establish network ties with key Chinese business leaders.
- Observe and study new and emerging institutional alliances across China's academic, business, and government public sectors.

Student Interns will be teamed with other competitively selected US and Chinese students to work on business projects in China-based host organizations. Bi-lingual American and/or Chinese students will be assigned to each team to assist those CIMTT students who do not speak Mandarin. Research/project tasks will be decided through a matching of relevant student experience/training/interest with the needs of the host organizations. Program coordination will be facilitated by the IC² Institute and locally based CIMTT mentors from China's public and private sectors. Each student intern will be will be required to complete a project report for the Chinese-based host organization and the CIMTT Program. This report may also be used for college credit/independent study at the student's university.

Where are the internships?

International internship opportunities are in various cities in Japan and China. NTCC internships may be in Austin, Houston, or in Silicon Valley, California. Students may express a location preference on the IC² internship application form. The following grid will aid your planning. A glossary follows the grid, to remind you of the names of the internship programs.

Program	Location				
	Austin	Houston	Silicon Valley	Japan	China
ATI/ASC	√				
NTCC	√	√	√		
TCN	√	√	√		
IC ² /EC	√				
JIMT				√	
CIMTT					√

ATI	Austin Technology Incubator
ASC	UT-Austin Software Council
NTCC	NASA Technology Commercialization Centers
TCN	The Capital Network
IC ²	IC ² Institute Research and Publication Programs
EC	UT-Austin Entrepreneurs' Council
JIMT	Japan Industry & Management of Technology Program
CIMTT	China Industry & Management of Technology Training Program

Applications for all internships may be obtained from the IC² Institute.

Conference Volunteers

The IC² Institute hosts or cosponsors several conferences each year on emerging technologies, entrepreneurship, and related topics. Each conference features speakers who are world experts from academia and industry, and an international audience of similar stature.

Student conference volunteers assist with conference arrangements and interact with the speakers and attendees to ensure the smooth running of the event. Volunteers gain invaluable contacts and access to leading-edge information.

Potential volunteers should contact the calendar coordinator at the IC² Institute.

Student Organizations

IC² Institute programs are often held in cooperation with the following student organizations:

International MBA Student Association
Japan Business and Technology Alliance
Pacific Rim Business Association
Plan II Engineering Association
Japanese Culture Club
Graduate Engineering Council
AEISEC
and others

Study Groups

Technology Transfer Study Group

The Technology Transfer Research Program (TTRP) of the IC² Institute involves faculty and students from UT-Austin along with several science and research agencies to create and study an industry-led consortium, the Agile Aerospace Manufacturing Research Center (AAMRC). Agile manufacturing encompasses the abilities to react to and fulfill unexpected supplier and customer demands. The IC² Institute is building an alliance of several key companies and institutions to satisfy this goal. This consortium of companies that IC² is researching includes Digital Equipment Corporation, Loral Vought Systems, Marlow Industries, Inc., Texas Instruments, and Vought Aircraft Co. For more information please contact, Dr. David V. Gibson at 478-4081 or davidvg@icc.utexas.edu.

China Study Group

The China Study Group is made up of interested UT graduate and undergraduate students campuswide. The group meets throughout the academic year for a series of

informal discussions, workshops, and seminars. Group facilitators are IC² visiting scholars and Research Fellows from China. One of the main objectives of the group is to prepare students for summer internships in China with the CIMTT program. A second objective is to facilitate multidisciplinary student teams who are working on term papers or other projects related to China for their classes. Current in-residence Chinese scholars and practitioners are: Piyu Yue, IC² Institute, Research Associate; Hong Tianhua, Visiting Scholar, University of Science and Technology, China; Weigao Shen, Visiting Scholar, Zhangjiang High-Tech Park, Shanghai; Mei Zhang, Science and Technology Exchange Center, Yunnan; and Professor Xia Guoping, Beijing University of Aeronautics and Astronautics. For more information please contact, Dr. David V. Gibson at 478-4081 or davidg@icc.utexas.edu.

International Activities

The IC² Institute is involved in a variety of international endeavors that make it a major figure in world business affairs. These activities include conferences, publications, and the exchanges of professors, students and ideas.

Conferences

The Institute has sponsored and/or co-hosted a number of academic conferences focused on international topics. These include:

- "Global Community Forum," Western Samoa, July, 1987
- "Commercializing Biotechnology in the Global Economy," Austin, April, 1990
- "International Technical Innovation and Entrepreneurship Symposium," Austria, September, 1990
- "Japanese Intellectual Property: The New Politics of US-Japan Trade," Washington, D.C., July, 1993
- "Creating and Sustaining the Technopolis Infrastructure," Curitiba, Brazil, August 1993
- "Dynamic Disequilibrium Modeling: Economic and Econometric Theory with Applications," University of Munich, Munich, Germany, September, 1993
- "Toward the 21st Century: New Directions, New Strategies," 1993 Japan-US Southern Conference, Dallas, TX, October, 1993
- "The Human Side of Technology: Opportunities for US-Japan Cooperation in Human Factors and Ergonomics Research and Applications," Albuquerque, NM, February, 1994
- "Spanning the Pacific: New Multi-media in the United States and Japan," Austin, October, 1994

Internships

Students at the University of Texas at Austin can participate in one of two international internship programs IC² has created. The Japan Industry and Management of Technology (JIMT) program at the IC² Institute offers Japan internship opportunities. A JIMT internship, with the support of Japan's Ministry of Trade and Industry (MITI), allows business and engineering graduate students the opportunity to do research abroad for a summer, a semester or a year in Japan. Students can spend time in China by applying for IC²'s other internship opportunity: the China Industry and Management of Technology (CIMT) program. The CIMT program started in 1994, sending fifteen UT graduate students to China for the summer. These students had the special opportunity to conduct research on tapping the opening trade opportunities in China and Hong Kong.

Visiting Scholars

People in academia from around the world come to Austin to work at the IC² Institute. A free sharing of ideas and information highlight the mutually beneficial

relationships IC² enjoys with its visiting scholars. These relationships often result in formal exchange agreements with the visiting scholars' home institutions and expanded IC² activities in their home countries. Some individuals who studied at IC² recently are:

- Dr. Boaz Golany, Israel
- Chuan-te Ho, Taiwan
- Dr. Hong-bumm Kim, Korea
- Dr. Hak-Sik Lee, Korea
- Dr. Seung-Chang Lee, Korea
- Professor Ramiro Wahrhaftig, Brazil
- Dr. D. Yogeswara Rao, India
- Dr. Nikolay Rogalyev, Russia
- Bo Bo Xia, China

Executive Development

A major focus of IC² activity is to increase the knowledge and competitiveness of persons in the business world through executive development. PRIDE 94, Programa Internacional de Desenvolvimento de Executivos (International Program of Executive Development), is an innovative executive education program aimed at international participation that IC² began in 1993, when Brazilian bank executives participated in a two week program at IC² to learn about the changes in the complex international banking environment. Chris Lake Marcum, IC² executive development director, describes the aim of IC² executive development to "provide the managers with a well-rounded theory and application program to expose them to the new business context of the next decade."

Monographs

Scholars at the IC² Institute continually produce academic papers and monographs focused on international issues. These papers often study the relationship of economic practices of the United States and other nations, forming ideas to help the US succeed in this globalizing economy. Recent monographs produced at the IC² Institute are:

- *The Technopolis Phenomenon*, 1990
- *Globalism Crosses National Boundaries*, 1991
- *Science, Technology and Society: A Japanese Perspective*, 1993
- *The Japanese Distribution System: Opportunities, Obstacles, Structures and Practices*, 1993
- *US-Japan Shared Progress in Technology Management*, 1994
- *Emerging Regions in the Pacific Basin*, 1994
- *Navigating the Japanese Market: Business and Socio-Economic Perspectives*, 1994
- *Industrial Development in Japan*, 1994
- *Silicon Sumo: US-Japan Competition and Industrial Policy in the Semiconductor Equipment Industry*, 1994
- *Protecting Intellectual Property in the US and Japan*, 1995

Academic Courses

Courses at the University of Texas at Austin that focus on international topics are supported and taught by the faculty of the IC² Institute. These classes touch on the issues of industry, technology and manufacturing, among others, in the international market. Some of these course titles are “Japanese Manufacturing Management,” “Intercultural Technology Transfer,” and “US-Mexico Telecommunications Policy.”

International Fellows

IC² fellows represent institutions in several countries other than the United States. A few of these fellows are:

- Dr. Armondo Gallegos, Peru
- Keiko Hitotsuishi, Japan
- Akira Ishikawa, Japan
- Hiroshi Matsumoto, Japan
- Gerhard Mensch, Germany
- Kiyoshi Niwa, Japan
- Dr. Hong-Chul Shin, Korea
- David Skyrme, United Kingdom
- Taeso Song, Korea

Fellows International Activities

IC² Institute fellows from the United States participate in a number of activities centered on issues around the world. Countries including Brazil, Japan, Russia, Hungary and Germany were touched by IC² research. Some highlights of these studies are:

- Gerald Albaum—visiting professor at the Hong Kong University of Science and Technology
- W.W. Cooper—paper studying operations research in Japan
- Robert Hisrich—established MBA program in Hungary and developed student programs in Russia
- George Kozmetsky—presentations in Brazil, Sweden and Mexico
- Tom Mabry—summer research at the Alexander von Humboldt Foundation, Germany
- Gerhard Mensch—researched privatization business development and executive education in eastern Europe
- Ilya Progovine—appointed Senior Science Advisor to one of the core institutions of Kansai Science City outside Osaka, Japan
- Sten Thore—triad of papers focused on the falling of communism in the former Soviet Union
- Piyu Yue—studied electronic industries and companies in North America, Western Europe, South America, and Asia

Financial Aid

Abell-Hanger Endowed Presidential Scholarships

Two Abell-Hanger Endowed Presidential Scholarships for \$2,000 each will be awarded for the academic year 1995-1996. The scholarships will be paid in two installments of \$1,000 each at the beginning of each semester.

These scholarships are for worthy students of the College of Business Administration and the Graduate School of Business with financial need and will reward and recognize those students whose academic achievements and research are in consonance with the goal, mission and objectives of the IC² Institute and for perpetuation of a free enterprise system and democratic society.

Applicants can pick up application forms from IC² (2815 San Gabriel) and should attach a three to five typewritten statement of proposed research to be carried out if selected for the scholarship. This proposal should:

1. describe the content of the research;
2. the methodology intended to be employed;
3. the importance of the research; and
4. the expected output, i.e., report, book of readings, working paper, show, etc.

IC² Assistantships

Graduate and undergraduate research assistantships are open to students on a funds-available basis. All interested students are invited to submit inquiries about current projects, and resumes, to the IC² Institute Research Programs Director or to individual faculty members.

Library and Academic Resources

IC²/RGK Library

The IC² Library is located on the second floor of the IC² building. The library contains current periodicals pertaining to business, technology and society, as well as bound volumes on these subjects and copies of all IC² publications.

The IC² Library also includes the UT-Austin campus' most complete collection on technology industry in Japan. This collection, built under the Japan Industry and Management of Technology (JIMT) Program, contains documents, ministry directories, books, and periodicals.

The library is open M-F. Please consult the IC² Information Services staff for a specific schedule of library hours.

Databases

Extensive databases on industry and entrepreneurship are available at the IC² Institute in the form of on-line access, CD-ROMs, and clipping files. Inquiries about authorization and use of these materials should be directed to the IC² Information Services staff.

The Institute draws on the full resources of the on-line databases provided through UT General Libraries (which include Lexis/Nexis, GPO Access, and OCLC). In addition to data available via the Internet, databases that can be accessed from or at IC² include: Standard & Poor's Compustat and Global Vantage, Computer Select, and NBIA On-line. Some research and teaching programs also have access to selected databases that are specific to their areas of study, such as the Microelectronics and Computer Technology Corporation (MCC) databases available to the JIMT Program. IC² also provides researchers and students access to a document database of electronic clipping files on areas of ongoing Institute research compiled from a variety of on-line information services such as Datatimes and CompuServe.

Strategy Room

The strategy room, located at the Austin Technology Incubator, contains twelve networked workstations in a U-shaped conference table, with a projection screen for the moderator's workstation. The network is equipped with VisionQuest group decision making software. The room is available for meetings and demonstrations using this and other groupware.

World Wide Web Page

Information on all IC² programs, publications, and upcoming events can be found on the World Wide Web at <http://www.utexas.edu/depts/ic2/main.html>.

Doctoral Graduates in Technology Transfer Program

- Avery, C.M. *Organizational Communication in Technology Transfer Between an R&D Consortium and Its Shareholders: The Case of MCC*. College of Communication, The University of Texas at Austin, Spring 1989. President, Partnerworks. Austin, Texas.
- Dietrich, G. *Spin-Out Companies as a Mechanism of Technology Transfer*. Graduate School of Business. The University of Texas at Austin, Fall 1989. Assistant Professor, College of Business, The University of Texas at San Antonio.
- Kim, E. *University-Industry Partnership in Continuing Engineering Education*. College of Education, The University of Texas at Austin, Fall 1989. Former consultant with Arthur Andersen Consulting, Washington DC. Currently, President, Vision 2000, Seoul, Korea.
- King, R. C. *Innovative Use of Information Technology and Organization Context*. Graduate School of Business, The University of Texas at Austin, Fall 1987. Assistant Professor, Joseph M. Katz Graduate School of Business, University of Pittsburgh.
- Millia, S. *Automating Human Service Expertise: The Validation of Knowledge-Based Expert Systems in Social Work Practice*. Graduate School of Social Work, Spring 1994.
- Muir, N. *The Study of Technology Strategy: Technology Transfer and Learning Processes in Shareholders of a Research and Development Consortium*. Graduate School of Business, The University of Texas at Arlington, 1991. Assistant Professor, University of Houston, Clear Lake, Texas.
- Roach, T. *Effective System Development in Complex Organizations: a Field Study of Systems Transfer and Use in the US Army's Medical Departments*. Graduate School of Business, Spring 1992. Lt. Col., US Army Medical Corps, Europe.
- Stewart, G. *Large Corporations and the Research University: An Examination of Formal and Information Technology Transfer Mechanisms*. Graduate School of Business, Spring 1992. Formerly manager of international support operations, Motorola Corporation, Austin, Texas. Currently with Texas Education Agency, State of Texas.
- Sung, T. K. *The Impact of Information Technology on Organizational Structure: A Control Perspective*. Graduate School of Business, The University of Texas at

Austin, Summer 1988. Senior Researcher, Korea Institute for Defense Analysis, Seoul, Korea.

Wey, J. Y. *The Diffusion of Interorganizational Systems Considered at Three levels of Analyze*. Graduate School of Business, Spring 1990. President, AMITA Corporation, Austin, Texas.

Wu, F.W. *Information Systems Supported End-User Interaction: Impacts on Inter- and Intra-Organizational Connectivity and Cooperative Behavior*. Graduate School of Business, The University of Texas at Austin, Fall 1989. Assistant Professor, Joseph A. Martino Graduate School of Business Administration, Fordham University, New York, New York.

IC² Institute
The University of Texas at Austin
2815 San Gabriel
Austin, Texas 78705

phone 512-478-4081
fax 512-499-0245

**APPLICATION
IC² INSTITUTE
GLOBAL INDUSTRY AND MANAGEMENT OF
TECHNOLOGY TRAINING PROGRAM
at THE UNIVERSITY OF TEXAS AT AUSTIN**

Name of Applicant: _____

University or College currently attending: _____

Field of Study and Degree Program: _____

Current Street Address: _____

City _____ State _____ Zip Code _____

Telephone (Day) _____ Telephone (Evening) _____

Permanent Address: _____

(if different from above)

City _____ State _____ Zip Code _____

Country _____

Telephone (Day) _____ Telephone (Evening) _____

PLEASE SEND ME MORE INFORMATION about the internship programs I have checked

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THIS IS MY APPLICATION for the _____ internship program.

Your application should include a typed one to two-page double-spaced essay concerning your academic and professional goals and your reasons and expectations for participating in the IC² internship program. Include specific personal or academic experiences that are relevant to your application. Also, please enclose a resume and a copy of your transcript from your current college or university.

APPLICATION DEADLINE: 1995 Summer Program-April 1, 1995

Return this application form to:

IC ² Internships IC ² Institute 2815 San Gabriel Street Austin, Texas 78705-3596 Phone: (512) 478-4081; Fax: (512) 499-0245
