A PORTRAIT OF THE IOE DEPARTMENT AT A GLANCE

As part of the departmental review process which occurs every five years, a review committee published a formal report dated April 1986. The review committee included IOE faculty members, faculty members from other departments, and prominent individuals from other universities and industry.

National Image: The IOE programs, both Undergraduate and Graduate, continue to enjoy an excellent reputation overall.

Faculty: In Fall 1986 the Department has 20 regular faculty evenly distributed among the ranks of Assistant, Associate, and Full Professor. This compares with 16 regular faculty in 1981, an increase of 25% in the last five years.

Sponsored Research Dollar Volume: The average new sponsored research project dollar volume for the whole Department is $1.8 million annually.

Faculty Publications: There were 112 refereed publications (research papers), 4 books, 50 book chapters, and 155 technical reports, etc. (several of these are currently in the refereeing process) written by IOE faculty in the last five years.

Student Body Size: The IOE Undergraduate and Master’s student registrations have remained stable, but the number of registered Ph.D. students has increased 51% in the last five years. In Winter 1986 term, there were 345 undergraduate students, 62 Masters, and 64 Ph.D. students registered in the Department. Of the 126 graduate students, 72 are domestic and 54 are foreign.

Degrees Awarded: In the last five years, on an average, the Department has awarded 103 B.S.E. degrees, 46 M.S. degrees, and 5 Ph.D. degrees annually. About 10% of the Masters graduates get dual M.S. degrees combined with a second M.S. degree from a variety of other University programs.

Courses Offered: On an average, 92 courses are offered in the Department annually. 15% of these courses are offered by the IOE, and another 17% of these courses are offered by faculty from another cross-listed department.

Class Sizes/Enrollments: The average class size in IOE courses was 68, 38, 25, and 8, respectively, for courses at the 300, 400, 500, and 600 levels. The average total annual student-course enrollments were 2,745 in all IOE courses.

Common Departmental Scholarship Funds: Currently, the Department spends approximately $75,000 annually for graduate student scholarships. In addition to these, the Department allocated $94,586 this year for Teaching Assistants, Instructional Aide and Grader appointments.

Chairman: One of the outcomes of the review was the reappointment of Professor Stephen Pollock as chairman of IOE for the next five years.

Further information and supporting documents, tables, etc. are presented in the report published by the review committee.

FACULTY CHANGES

Yavuz A. Bozer joined the IOE faculty in January of 1986. He received his Ph.D. degree from the Georgia Institute of Technology in Atlanta where he worked as a consultant and full-time Research Engineer. His major areas of interest include material flow systems (in warehousing and manufacturing) and facilities layout and design.

Jay Elkerton joined the IOE faculty in January of 1986. He is a Ph.D. graduate of Virginia Polytechnic Institute and State University. His major areas of interest include human-computer interface design, cognitive factors of human-system interactions and adaptive software interfaces.

Romesh Saigal, a distinguished Professor previously at Northwestern University, joined the IOE faculty in the Fall of 1986. He received his Ph.D. degree from the University of California, Berkeley. His major areas of interest include mathematical programming, fixed point computing and optimization.

Aharon Ben-Tal has been visiting the department since the beginning of the Fall term. He is an Associate Professor at the Technion, Haifa, Israel. His major areas of interest include Nonlinear Optimization, Convex Analysis, and Stochastic Programming.

W. David Kelton, who has been with us for the past three years as Assistant Professor, recently joined the University of Minnesota. We wish him good luck and success in his new position. He will be missed as a good friend and capable colleague.

Dev Kochhar, Associate Professor, who has been with us for the past six years, will be leaving us at the end of the Fall 86 term. He has accepted a position as a member of the technical staff at AT&T Information Systems in Morristown, New Jersey. We wish him the very best in his future endeavors.

John Moore has been visiting the department since the beginning of the Fall term. He is Associate Professor/Chairman of Management Sciences at the University of Waterloo. His current teaching and research interests include developing mathematical models for planning and scheduling.
manufacturing facilities and software, database and computer interface design.

**FACULTY NEWS**

James Bean (and graduate student Chuck Noon) were finalists in the Institute of Management Sciences Edelman Award for a project at Homart Development Co. that saved the company approximately $100 million. His research activities continue to be in infinite horizon optimization and its applications – primarily equipment replacement. Professors Bean, Lohmann and Smith have had support from IBM, AT&T, GM, DOT and NSF on this work.

John Birge continued his work on stochastic optimization models and methods for scheduling jobs on unreliable machines. He finished a 3-year project with GM concerned with the design of a scheduling system for their factory-of-the-future. He also received the Young Investigator Award from the Office of Naval Research. This award is the only such award in Operations Research and one of 13 total awards in science and engineering throughout the United States.

Don B. Chaffin was chosen to be President-elect at this year’s national meeting of the American Society for Biomechanics. He has been elected to Fellow status in both the Ergonomics Society of Great Britain and the Human Factors Society. Also, Dr. Donald Millar, Director of the National Institute for Occupational Safety and Health has nominated Don Chaffin to become a member of NIOSH’s Board of Scientific Advisors.


Jeffrey Liker is completing work on participative ergonomics programs in two Ford automotive plants. This work is the basis for organizing ergonomics efforts (to redesign workstations) at other Ford locations. Chrysler has approved a grant to continue research on implementation of ergonomics.

Jack R. Lohmann, during the past year, was on sabbatical leave. He had an appointment as a Visiting Associate Professor in the Department of Industrial and Systems Engineering at the University of Southern California and (in the Winter term) as a Professeur Associe in the Department de Sociales Economiques, Sciences et Humaines at Ecole Centrale des Arts et Manufactures in Paris, France. In addition to continuing his work on Replacement Economic Decision Making with Evolving Technology, he had the opportunity to interact with colleagues during research presentations in Austria, Hungary, Sweden, Denmark and the Netherlands. Currently, he is in the third year of his five year NSF Presidential Young Investigator Award.

Katta G. Murty and Stephen M. Pollock visited the Indian Statistical Institute (ISI) in India during Summer 1986 on an NSF-sponsored project. They gave seminars at a Summer Institute on “Stochastic Models in Reliability and Other Areas” organized at ISI, Delhi, for faculty from Statistics, Mathematics and IE departments from universities all over India. They also presented research seminars at other Institutes in India including the Systems Research Institute (Pune) and Defense Science Laboratory (Delhi), and consulted on operations research applications at four major industrial plants in India. While in Bombay, they spent some time with Chakor Doshi (an IOE alumnus) who is Managing Director of Walchandnagar Industries, Ltd.

Katta G. Murty’s new textbook “Linear Complementarity, Linear and Nonlinear Programming” covering the areas of Linear Complementarity, Quadratic Programming, new approaches to Linear Programming (Karmarkar’s algorithm and other such methods of feasible direction approaches to LP) and Nonlinear Programming, is being published by Heldermann Verlag, West Berlin, before the end of 1986.

Stephen M. Pollock and Damodar Golhar (Ph.D. 1983) recently published a paper in Medical Decision Making showing how a sequential analysis of blood sugar levels can save almost 50% (compared to existing methods) of blood samples needed for diagnosing diabetes.

**INSTITUTE OF INDUSTRIAL ENGINEERS**

The local chapter of IIE continues its critical role in providing leadership and direction to industrial engineering students at the University. The results of the election recently held are just in:

- Mary Beth Soloy: President
- Michael Grossman: Executive Vice-President
- Renee Mortier: VP Chapter Development
- Jerry Rattenbury: VP Programs
- Sarah Donmeyer: VP Fundraising
- Kim Clack: Membership
- Barb Ziots: Treasurer (VP Finance)
- Marisa Bahn: VP Communications
- Sulo Bardha: Luncheon Coordinator
- Lillian St. Angelo: Luncheon Coordinator
- Paula Cupples: Luncheon Coordinator
- The chapter sponsors luncheons and invites numerous speakers from various industries - alumni are encouraged to volunteer for this rewarding activity. The chapter also organizes
social gatherings and student projects as well as encouraging membership in IOE.

**IOE ALUMNI ACADEMY UPDATE**

The University of Michigan IOE Alumni Academy was founded in the fall of 1985 by a group of alumni who wished to use their experience after graduation for the purpose of maintaining and enhancing the IOE program. The mission of the Academy is to strengthen communications between the Academy's members and all the alumni of the department through regular interaction with the students, faculty, and staff of the department.

At the first meeting, the Academy approved By-Laws for the organization and discussed activities to be carried out by the Academy. As a result of the discussion, the IOE Alumni survey was developed and the results appear in this Newsletter. The Academy is also reviewing potential activities such as creating a resume clearinghouse for department alumni, planning an alumni day, and assisting the department in several other functions.

For those interested in further information on the Academy's activities, or for those who wish to be considered for membership, please contact:

The IOE Alumni Academy
IOE Building
The University of Michigan
Ann Arbor, Michigan 48109-2117

Please remember that our accomplishments and the IOE department can be strengthened with your participation.

**ALUMNI SUPPORT**

Even if you normally just "glance at" our newsletter, we certainly hope you will read this section and consider the importance of private gifts and alumni support to our Department and the University in general.

Although we have all known the University of Michigan as a public (state supported) institution, the manner in which our University is funded makes it look very much like a private institution. In fact, annual gifts to the College of Engineering have grown rapidly in the recent years. However, in terms of alumni support, we are still considerably behind private institutions such as Yale, Harvard, or Stanford.

The general public as well as our alumni are unaware that Michigan is increasingly privately funded. They are unaware of the importance of private support in determining the strength of the University. Considering the hard-earned success that many of you achieve as Michigan graduates, we hope reading this section will remind you that financial support to deserving students can go a long way in helping them through the program.

There are two levels of support. The first level consists of alumni who make regular contributions to the University. The second level consists of one-time gifts. These gifts are generally large and can come from individuals or corporations. Alumni need to be aware of the importance of their regular contributions on the first level and of the importance of their gifts on the second level in supporting the University.

If you think that you might have an interest in supporting the University or our Department, we encourage you to act now. For this reason we have set up a number of points of contact within the College for further inquiry and coordination:

Dan Atkins  
(313) 763-2174  
Associate Dean for Research

Brad Canale  
(313) 763-2160  
Director of Development

Robert Schneider  
(313) 763-5630  
Director of Corporate Relations

Donations can be designated for the University as a whole, the College of Engineering or the IOE department. You can even specify exactly what the funds are to be used for. You may support the University with the following gifts:

1. Presidential Fund
2. The University Library
3. Other (please specify)

For supporting the IOE department, you may also select from the following list:

1. Wyeth Allen Scholarship (for undergraduates)
2. Arthur Andersen IOE Scholarship (for outstanding senior)
3. Clyde W. Johnson Memorial Scholarship (for deserving graduate and undergraduate students)
4. Rita and Theodore Williams Scholarship (for joint MBA/MSE degree)
5. IOE Discretionary Funds (for equipment, facilities, books, software, seminar series)
6. IOE Activities
7. Other (please specify)

We sincerely hope to receive your contribution in response to our newsletter. Please make your check payable to the University of Michigan. If you prefer to contribute to any of the IOE scholarships and/or funds listed above, please indicate so in a cover letter or the "for/memo" section of your check. Otherwise, your contribution will be used at the discretion of the University.
If you have questions regarding any of the above potential uses or you think you might be interested in setting up a scholarship/award fund please call:

Steve Pollock Chairman, IOE
(313) 764-9403

Note: If you received degrees from several University of Michigan programs, you may receive more than one annual fund solicitation. The University appreciates your support of any or all of these programs. Your gifts are tax deductible as allowed by law.

ALUMNI NEWS

AMY HANCOCK BOYD (IOE '86) completed her Ph.D. and accepted a faculty position at Colby College in Maine.

JOEL S. DEMSKI (IOE '62, MBA '63) is the first person to be named to the Joan E. Hornsby Professorship in Accounting at Stanford University's Graduate School of Business. Demski, who currently is the Holden Professor at Stanford, is nationally known for his research on the economic analysis of accounting information systems.

MONICA FOX (IOE '83) is employed at Kelsey-Hayes. She is responsible for plant-wide implementation of a production planning and MRP II system.

RONALD P. HARANDA (IOE '62), Director of Strategic Planning for the Queen's Health Systems, was advanced to Membership status in the American College of Healthcare Executives at its 52nd Convocation Ceremony. To qualify for membership, Haranda demonstrated his commitment to continuing education, progression in professional experience and participation in community affairs and voluntary health care activities.

STEVEN MIESOWICZ (IOE '84) recently took a job at Hydraumatic Division of General Motors in Product Assurance.

ALUMNI SURVEY RESULTS

Last spring over 450 IOE alumni (40% of those surveyed) responded to a survey on the IOE department. The survey was developed and supported by the the IOE Alumni Academy and was part of the alumni input for the 5-year program review of the Department.

The typical respondent to the survey: last attended the Department in 1969; has an IOE undergraduate degree (73.8%); has an advanced degree (86.2%); earned all degrees from U of M (52.1%); does not currently practice industrial engineering (76.9%); has gross annual income in the range of $50,000-$60,000 with 17.6% making more than $100,000; and strongly believes current students should have coursework in software design (79.6%)..

Other highlights from the survey are: the majority now work in a management position; 98% feel the quality of education they received from the IOE department was good, excellent or the best; the balance of theory and application within the program was at the right balance or slightly too theoretical; the most useful courses were in information systems, engineering economy, and organization and management; if alumni could change the coursework offered in any of the areas, 33.6% would have made the courses more applied.

In thinking of future trends and developments in their profession or industry, alumni indicated that the new subjects the Department should be developing are artificial intelligence/decision support systems (29%), areas in organization and management (22.4%) or other Information Systems areas (18.7%).

A number of respondents provided comments that were helpful and revealing. Particularly noted by graduates from the 50's and early 60's was a bias in the survey toward current departmental activities and program. This will be corrected in future surveys, since input is needed about the durability of an IOE degree.

Follow up will be made with those who indicated on their response that they would be willing to help the Department with summer jobs, research projects, guest speaking, and fund raising.

A summary of the responses (shown either as percentage breakdown or average response, whichever is appropriate) is shown on the following survey sheet.
1. In what area is your undergraduate degree? (Please check one that best applies)
   - I.O.E. [73.8%]
   - Other engineering [12.8%]
   - Public Health [0.5%]
   - Other [7.2%]

2. What is your most advanced degree? (Please check one that best applies)
   - M.S. (I.O.E.) [31.3%]
   - M.B.A. [31.8%]
   - Ph.D. (I.O.E.) [4.6%]
   - Other Masters [4.1%]
   - Ph.D. (other) [3.6%]
   - J.D. (Law) [4.6%]
   - Bachelors (no response) [13.8%]

3. Which of the following describes where you earned your degrees? (check one)
   - Advanced degree at U.M., undergraduate elsewhere [52.1%]
   - All degrees from U.M. [23.7%]
   - Undergraduate at U.M., most advanced degree elsewhere [20.1%]
   - Other [4.1%]

4. Which of the following best describes the place you work? (check one)
   - Heavy Manufacturing (e.g. auto, steel, aircraft, microchips) [24.1%]
   - Light Manufacturing (e.g. custom machining parts, light electronics, etc.) [15.4%]
   - Small Business [4.2%]
   - Hospital [4.1%]
   - Management Consulting [7.7%]
   - Construction [1.0%]
   - Hospital Consulting Firm [2.6%]
   - Other [4.6%]
   - Other Type of Manager [2.2%]
   - Management Consulting [7.7%]
   - Hospital [33.8%]
   - Other [4.1%]
   - Construction [1.0%]
   - Hospital Consulting Firm [2.6%]
   - Other [4.6%]
   - Hospital [33.8%]
   - Other [4.1%]

5. Which of the following best describes your current job? (check one)
   - Industrial Engineer [4.0%]
   - Quality Assurance Engineer [1.2%]
   - Information Systems Engineer [4.0%]
   - Software Engineer [2.3%]
   - Management Engineer [8.1%]
   - Management [1.3%]
   - I.E. Manager [1.2%]
   - Project Manager [10.4%]
   - University Faculty [5.2%]
   - Corporate Executive [15.6%]
   - Other [4.1%]

6. In what income range does your current gross income fall? (This optional question is for the benefit of students in I.O.E. who wish to have some idea of what they might look forward to)
   - $10k-$20k [18.2%]
   - $41K-$50K [10.7%]
   - $61K-$70K [10.7%]
   - $71K-$80K [17.6%]
   - $81K-$100K [7.0%]
   - Greater than $100K [12.8%]

7. How many courses did you take in each of the major areas of I.O.E.?
   - Operations Research [1.7%]
   - Ergonomics [1.3%]
   - Production & Inventory Control [1.4%]
   - Information Systems [1.1%]
   - Engineering Economy & Capital Budgeting [1.2%]
   - Facility Layout [1.1%]

8. Rate the usefulness of knowledge acquired from coursework in each of the areas below. Please use the following scale for your answers:
   - Operations Research [2.5]
   - Ergonomics [2.4]
   - Production & Inventory Control [2.7]
   - Information Systems [2.2]
   - Engineering Economy & Capital Budgeting [2.6]
   - Facility Layout [1.7]
   - Hospital Engineering [2.4]
   - Organizational Management [2.3]

9. To what degree would more coursework in the area have benefitted your professional work? Please use the following scale for your answer:
   - Operations Research [1.9]
   - Ergonomics [1.7]
   - Production & Inventory Control [2.3]
   - Information Systems [2.8]
   - Engineering Economy & Capital Budgeting [2.5]

10. To what degree have you designed software as part of your professional work (considering your entire career)?
    - Not at all [26.2%]
    - Slightly [34.6%]
    - Considerably [20.9%]
    - A Great deal [18.3%]

11. To what degree would you recommend current student in I.O.E. have some coursework in software design?
    - Not at all [0.1%]
    - Slightly [19.4%]
    - Considerably [53.9%]
    - A Great deal [25.7%]

12. Overall, how would you rate the quality of education you received from the I.O.E. program (compared to what you've heard about other programs in the area from your colleagues, etc.)
    - Poor [0.5%]
    - Okay [1.6%]
    - Good [42.5%]
    - Excellent [42.5%]
    - The best [13.0%]

13. How would you rate the balance of theory and application in the I.O.E. program for you professionally?
    - Much too Theoretical [1.7%]
    - Too Theoretical [38.7%]
    - Right Balance [58.6%]
    - Too Applied [1.1%]
    - Much Too Applied [0.0%]