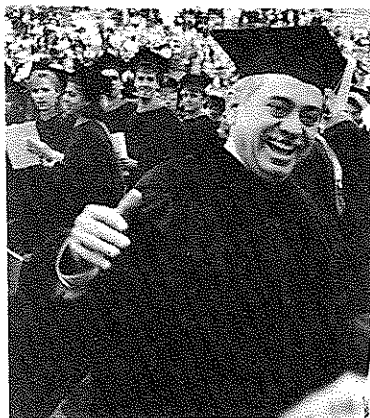


Lehigh University - Industrial and Manufacturing Systems Engineering Department

Summer 1995

Chairman's Message

It is my distinct pleasure to greet all of you and share with you many of the achievements and developments of your department during the 1994-95 academic year. Since my arrival in August, 1994, I have been particularly impressed by the excellent quality and spirit of our students, the commitment and dedication of our faculty and staff to our educational mission, and the sincere affection and loyalty accorded to our department by you, our alumni. Maintaining and enhancing this legacy is clearly my greatest challenge and I look forward to updating you on the progress of our program for many years to come.



The reputation of our department continues to grow through the many efforts of our distinguished faculty. I would like to make particular note of the national recognition bestowed on our department in 1994-95 through Prof. Mikell Groover's selection as the recipient of the IIE Albert Holzman Distinguished Educator Award and Prof. Greg Tonkay's selection as one of IIE's Outstanding Young Engineers. Our commitment to activities that provide a "hands-on" learning environment for our students continues through the involvement of many of our faculty in industry-based applied research endeavors sponsored by the Ben Franklin program as well as various other federal and private industry sources. The creation of a new Manufacturing Logistics Institute within our department is another significant step in the creation of a research environment that strives to bridge the gap between industry and academia. Many of the innovative efforts described in last year's newsletter, such as faculty involvement in NSF's Focus Hope Manufacturing Education Coalition, the development of our new Electronics Manufacturing Laboratory, and the implementation of a distance learning Master of Science degree in Quality Engineering continue to bear fruit and mark our department as a leader in engineering education.

The level of activity of our students has always been a source of pride for the department and 1994-95 was no exception. In these pages you will read about activities such as the First Annual Faculty/Student Volleyball Tournament, the IMSE Graduate Student Research Symposium, various plant tours and many other activities that reflect the level of faculty-student interaction maintained by the department. Perhaps the most significant event of this nature was the student organized IMSE Career Day activity held on February 11, 1995. This event brought together over 200 alumni, students, and faculty in an all-day activity where alumni experiences and insights in careers such as manufacturing, information technologies, consulting, government, and service organizations were shared with our students. I would like to express once again our sincere appreciation to all of you that

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First Annual Career Day - A Complete Success

The IMSE career day started off as a mass mailing to all IMSE alumni asking them if they were interested in attending a career day. Elizabeth Thaler, coordinator of the career day, was hoping for just a few responses and was pleasantly surprised and a bit overwhelmed when the letters began pouring in. Over 70 alumni and 80 students attended the first annual IMSE career day on Saturday, February 11th. Some of the many companies represented were Channel, Andersen Consulting, Chase Manhattan Bank, Air Products, Bethlehem Steel, and the Federal Bureau of Investigation.

The day's activities took place in Mohler Laboratory and included panel discussions and guided tours of the Computer-Integrated Manufacturing Laboratory and the Manufacturing Technology Laboratory. The four panel discussions were divided into the following groups: consulting, manufacturing, government/service/business, and computers and technology. Each panel consisted of five alumni who were assigned to answer these questions: 'Where do you think your industry is

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Distinguished Faculty Member Retires - Dr. John Adams

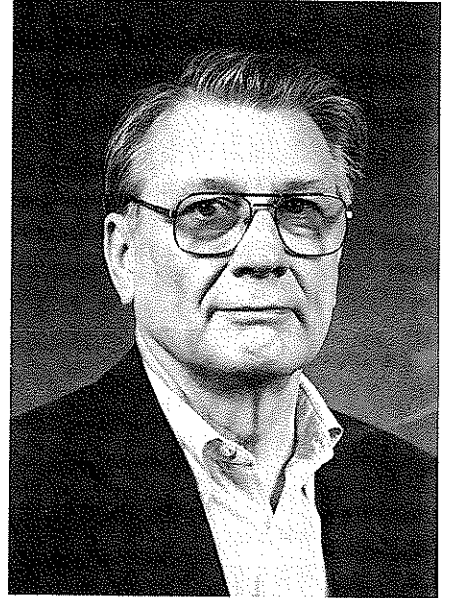
The door to Mohler's Office 475 never seems to close, and its no surprise to see a student sitting next to Dr. John W. Adams, inquiring about a problem. This is the result of his unending dedication to Lehigh University, to the department, and to its students. However, his door will be symbolically closing this spring when Professor Adams retires after 30 years of service to our university.

Professor Adams was born in South Dakota and was raised in Nebraska. Shortly after World War II ended he joined the navy, having never seen an ocean. After departing the San Francisco Bay aboard the

U.S.S. Pasadena, Professor Adams' shipmates began to experience nausea from the high seas. Professor Adams felt blessed that he was immune to this discomfort and headed to bed. He awoke to two years of sea sickness.

Joining the University of Nebraska's ROTC program was a blessing to Professor Adams after his naval experience. Upon earning a degree in chemical engineering, Professor Adams completed his military service in the Army. Adams then ventured to the University of North Carolina at Chapel Hill to earn his doctorate in statistics.

While teaching at Lehigh, Professor Adams has taught first and second generations of the same Lehigh families. He often helps puzzled alumni by answering their probabilistic questions. Adams has also contributed to industry through his extensive consulting efforts. Although Professor Adams has retired this spring, he will remain an intricate part of Lehigh's Industrial Engineering faculty. He will keep his office and continue advising undergraduate and graduate students. He will also teach a graduate course for Lehigh's Master of Science Quality Engineering Program.



Professors Wu and Storer Establish Manufacturing Logistics Institute

During the 1994-95 academic year, Professors David Wu and Bob Storer received approval for the establishment of a Manufacturing Logistics Institute (MLI) with the IMSE Department. Other faculty associated with this initiative include Professors Wilson, Burke, and Martin-Vega.

The term Manufacturing Logistics refers to all planning and coordination activities required to carry out primary manufacturing processes between the point where customer orders are received and the point where final products are shipped. Activities included in this scope typically involve production planning, scheduling, resource

allocation, information and materials management, and shop floor monitoring and control. Distribution related problems from raw material sources to plant as well as from plant to customers also lie within the scope of activities contemplated by manufacturing logistics. The concept is receiving increasing attention in the industrial sector as a primary source of competitive enhancement and productivity improvement. Research in this area draws primarily on analytical tools in operations research, applied statistics and information systems and technologies.

The objectives of the MLI are to provide students and faculty with a new resource

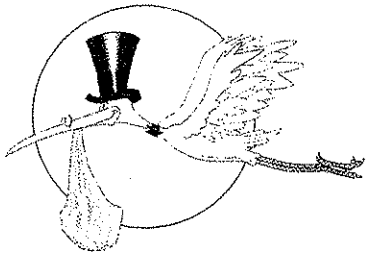
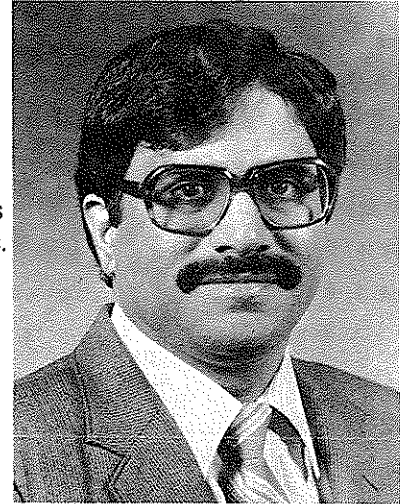
of meaningful interaction with industry, to pursue quality research of critical industrial importance, to cultivate a stimulating learning environment, and to further develop and focus the department's strengths in the area of manufacturing logistics. The MLI is committed to a strong educational mission with a goal of creating "teaching laboratories" in real industrial environments through cooperation with industrial partners.

The MLI is housed on the third floor of Mohler Lab. Initial funding for the Institute has been provided by the \$300,000 joint grant from the National Science Foundation

and the BethForge division of Bethlehem Steel. Additional support is provided through Ben Franklin projects. Seven graduate students are currently supported by the MLI. Future activities include hosting an industry--university workshop in manufacturing logistics during 1996. Funding for this effort is being sought from NSF and NIST as well as industrial partners.

Dr. G. Sathyanarayan Promoted

Dr. G. Sathyanarayanan, or "Sathya" as he is best known, was promoted to Full Professor of Industrial and Manufacturing Systems Engineering effective starting the Fall Semester of 1995. He has been a faculty member at Lehigh since 1984. Professor Sathya received his Ph.D. in Mechanical Engineering from Michigan Tech and teaches courses in the areas of manufacturing processes, manufacturing systems and production systems. His research interests are in the area of non-traditional manufacturing processes. He recently received an NSF Equipment grant that significantly enhances the department's research capabilities in these areas. During the 1991-92 academic year, Prof. Sathya spent a sabbatical year in Germany where he was involved in various research activities in close collaboration with the Technical University of Berlin and their associated Fraunhofer Institute. We would all like to congratulate him on his promotion.



Congratulations to Dr. Laura Burke and her husband John on the birth of their daughter, Katherine Suzanne, on July 4th.

Chairman's Message Cont'

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joined us that day, as well as the many others who wrote in with words of advice that were also shared as part of the activities of that very special day.

Despite national trends that indicate a difficult employment picture for many college graduates, I am also pleased to inform you that our 1995 graduates found a very welcome job market with practically all of our seniors placed prior to graduation. The breadth of opportunities for our graduates is encouraging and makes us believe that our program is providing our students with critical value-added skills. Our commitment to improvement, however, is reflected in benchmarking exercises that we have carried out this year with what we consider to be premier IE programs, as well as plans for a review of our curriculum during the next academic year.

Finally, I feel that it is important for you to know that even though we will always strive to improve the reputation of our program, these efforts will not be made at the expense of quality teaching and the educational legacy that was left by George Kane, Wally Richardson and many others who provided the philosophical foundation upon which this department stands. Our challenge lies in balancing our research and educational efforts in such a way that we can improve upon our current rating as one of the top 15-20 IE programs in the nation and extend our scope both nationally and internationally. I welcome your advice and support and look forward to sharing our progress with you through our future newsletters and related correspondence.

Departmental Activities

* Our **First Annual Faculty/Student Volleyball Tournament and Barbecue** was in September. There was a terrific turnout by both students and faculty for this evening of food and fun. Whether they were out on the volleyball court or just hanging out by the grill, the students and faculty were taking advantage of the great opportunity to see each other outside of the classroom. Although the faculty did wind up winning the game, the students certainly made them work for their victory.

* The students also had the opportunity to go to **Hershey Park** in September for a tour. Students filled two vans as they headed down to Hershey, Pa. to see how the chocolate is made. Not only did they go on the tour, but they were also able to enjoy the rest of the day at the Hershey Amusement Park.

* The students waited a year to go on the **Binney & Smith Tour** in Easton, Pa, and they finally got to enjoy it in January. It was well worth the wait. The students learned the history of the crayon business and saw how they produce crayons and markers.

Year End Banquet & Student Awards

The department enjoyed another successful and entertaining end of the year banquet this year. Under the direction of Tina Ianozzi, the banquet was held at the Hotel Bethlehem. The program included a tribute to the retiring Professor Adams, in which a scrap book with pictures and mementos from students and faculty was presented. Professor Martin-Vega, the new chair of the department, gave the address. Students enjoyed learning more about faculty from his talk, and seniors especially were inspired by his comments. The outstanding teaching award was presented to Professor Emory Zimmers this year. IIE and IE Council were recognized, as were new initiates in Alpha Pi Mu. Other IEs who have received awards or have been active on campus were noted as well. The outstanding junior award was announced, and it went to Rob Christie and Jenna Petrosky (a tie). The outstanding senior award was presented from the senior chapter of IIE to Lisa Quinn. The evening ended on a light note, as students and faculty engaged in some good-natured ribbing about their respective characteristics.

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Alumni Return for IMSE

Career Day

heading?', 'Why did you chose Industrial Engineering?', 'What is a positive and negative experience you've had in your field?', and 'What are your current job responsibilities?'. These discussions gave students the opportunity to hear about the many different career paths open to Industrial Engineers.

In addition, each student was paired with an alumni whose career matched their interests and goals. The student was given the opportunity to ask the alumni about his/her career in between panel discussions and at lunch. Lunch was held at Rathbone Dining Hall, where Professor Adams, who has taught all of the students and most of the alumni, was honored for his teaching and accomplishments.

The day was a complete success. The students were given a glimpse of the many functions of Industrial Engineers in various industries. The alumni enjoyed seeing their former classmates and discussing their experiences. Thank you to all students, faculty and alumni who participated in this event.

Lehigh University Offers Master's Program Via Satellite

Imagine going for your Master's Degree without ever setting foot on campus. A new program in quality engineering being offered by the Industrial and Manufacturing Systems Engineering Department will allow students to do exactly that.

The Master's Degree in Quality Engineering program offered via satellite is a non-thesis program requiring a minimum of 30 credit hours of coursework. The first course, Total Quality Management, was offered in January, 1995.

"Satellite education is very powerful and demanding," said Keith M. Gardiner, Lehigh professor of Industrial and Manufacturing Systems Engineering. "The course will make students aware of the tools and techniques needed for continuous improvement in everything they do. In addition, the experience will expose them to a broad spectrum of industry."

According to John Adams, retired professor of Industrial and Manufacturing Systems Engineering, the idea of distance education is appealing to industry during this cost-cutting age because it makes in-house training programs more affordable. "The new program offers educational opportunity to people who can't come to Lehigh," said Adams, who helped develop the quality engineering program at the university. "It is ideal for on-the-job training."

The teaching of Total Quality Management will be a collaborative and interdisciplinary effort with the College of Business. Along with Gardiner, the quality engineering course will be taught by Lehigh faculty members Robert H. Storer, associate professor of Industrial and Manufacturing Systems Engineering, Manash Ray, assistant professor of business, and assisted by guest instructors.

A Bachelor of Science degree in engineering or science is required for admission, although other educational backgrounds will be considered. Candidates with industrial work experience are preferred.

With this program, the employee will take a few hours a week from the work schedule and go to the receiving room at the company where he or she will watch and listen to the lecture. The telephone hook-up in the receiving room will allow students the opportunity to ask questions of the professors during class and to make presentations to their colleagues. Every company will have a site coordinator.

At test time, exams will be sent to the companies by next-day mail service. Immediately after the exams are taken, they will be sent back to Lehigh where they will be graded.

IMSE Research Symposium, 1994

The first Industrial and Manufacturing Systems Engineering Symposium was held on September 20, 1994 from 7 to 9 pm. Sponsored by the department, the IE Council and the Lehigh Valley Chapter of the Institute of Industrial Engineers, the symposium provided an opportunity for graduate students and industry to share their research. Participants submitted a short abstract and prepared a poster which explained their research.

The symposium is the result of an effort by Seth Flanders, the Chairman of the 1994 Symposium Committee, to promote collaboration between students, faculty and industry. "It is often tough for a new graduate student entering the department to determine what the research interests of the faculty are", Seth said. "Participants in the symposium are available for questions, allowing students and faculty to exchange ideas. By including industry participants, the student can see what type of research is being carried out at local firms." Every attendant received a booklet containing the abstracts of the research presented at the symposium.

Thirteen students and six industry participants were involved with this year's symposium. The symposium attracted many attendees from area businesses, students and faculty. The students who participated felt that the symposium was beneficial and would like to see it become an annual event.

Benchmarking with Penn State

IMSE's staff involved in a number of exciting events during 1994-95. One of the most interesting activities was benchmarking ourselves against another IE department's staff. On Wednesday, December 7, 1994, we received a visit from the staff of Penn State's IE department for an exchange of views and information regarding our respective roles and functions. This was then followed up by our visit to Penn State on April 5, 1995. Although our departments are of different sizes, our courses, laboratories, and major thrusts are similar in content and scope.

To initialize our relationship with Penn State's staff, we first introduced ourselves, provided them with a tour of our facilities, and had one-on-one discussions with personnel in similar staff positions. We exchanged ideas and discussed common administrative practices, courses, software and hardware support and usage, and related policies. A similar agenda was followed during our visit to Penn State and at the conclusion of both visits brainstorming sessions were carried out to discuss common objectives and where to go from there. While we found that similar challenges and problems exist within our departments, we were also able to observe differences in operating policies and procedures that open up the door for future improvements. We look forward to continuing this activity next year and enhancing both the professional and personal relationships that were started through this benchmarking exercise.

Average Starting Salaries of Lehigh's Engineering Graduates

Engineering Discipline	1992	1993	1994
Chemical Engineering	\$38,634	\$36,795	\$36,156
Civil Engineering	\$29,502	\$29,565	\$28,712
Computer Engineering	\$35,467	\$32,229	\$36,982
Computer Science	\$32,400	\$32,260	\$33,250
Electrical Engineering	\$34,975	\$33,101	\$32,436
Industrial Engineering	\$31,314	\$34,350	\$33,024
Material Science & Eng.	\$30,580	\$31,092	\$30,917
Mechanical Engineering	\$32,613	\$32,738	\$33,373
Engineering Physics			\$25,250

IE DEPARTMENT ALUMNET

Inspired by a similar program at RPI, Lehigh's Industrial Engineering Department is exploring the possibility of creating an "alumni net" in which current students are paired with willing department alumni as part of an informal mentoring system. Students are often uncertain about what life after graduation is like and what the working world holds for them. In fact students are always very interested in talking to the alumni who visit us from time to time. What we have in mind is to create a data base of alumni willing to serve as "contacts in the real world". We envision that students would be assigned a mentor based on interest area/position, and perhaps geographic area. Students would be asked to contact their mentor by phone at least once a semester for the purpose of getting your perspective on work and Industrial Engineering, and to answer any questions they might have. Questions involving things like "what it is like to be a practicing engineer", corporate politics and ethics, the importance of grades, career advancement strategies, different career possibilities, "we don't really need to know statistics do we?", and how to find a job are often asked by students. The perspective of our alumni (who have faced these same issues) should be an especially valuable resource for our students.

As students start thinking about finding a job, alumni contacts in industry may start to look less like mentors, and more like potential employers. It is our intention to create a mentoring program, not a placement service. Yet alumni contacts could be a valuable resource for our students in the job search process as well. The best plan would seem to be to let you decide if you want to serve as a mentor only, or if you would be willing to be contacted about employment and co-op positions. Of course the alumnet database will be used only for the purposes described here.

The success of this program relies first on a sufficient response from our alumni, and then later on the willingness of the students to overcome their shyness and "make the call". If you would be willing to serve as an alumnet mentor, we would greatly appreciate it if you could return the information below. Also if you have any suggestions as to how this program could be improved, we would appreciate your advice.

Name _____

Year of Graduation _____

Employer/location _____

Job title/description/field _____

Address _____

Phone number at which student can contact you _____

Best time to reach you _____

I am willing to serve as a mentor. YES _____ NO _____

I am willing to be contacted about employment. YES _____ NO _____