

Global Outsourcing to Engineer Retraining: New Skills for New Jobs in a Modern World

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ABSTRACT

The profession as an electrical engineer has undergone many changes in the last 20 years. Many of the design jobs have been outsourced, downsized or eliminated. While there is an oversupply of one type of engineer, there is a significant shortage of another type of engineer. Jobs in New York area represent the pulses of the engineering profession. Defense contractors have moved out of the area but microwave engineers are still in demand. Programmers in Java and C# .NET are especially in acute shortages. In the banking, construction, finance and healthcare industry, Project Manager is the hottest job title. For the displaced electrical engineers, several options remain. First one is to continue sending resume to the design manufacturing firm and trying to get work. Second one is to start his/her own design engineering firm. Then the problem is marketing. Most engineers dreaded marketing. This new design company is normally short-lived. The third choice is to take courses to get new skills that the modern society needs. To take a course in Java, C# or Project Management, the cost is \$1,200 at a two-year college or \$2,500 at a professional training organization. Since 1993, IEEE North Jersey Section provided 16 low-cost courses (specifically on C Programming, C++ Programming, Java Programming, Advanced Java Programming, Project Management, Marketing Research, and C# .NET Programming), training a total 220 engineers/professionals by this author. The collaboration between academia, industry and private firms make it possible to achieve the retraining goals. It generated an inventory of the effective activities, developed the action plan and delivered the end results. The bottom line: successfully retrained engineers to work as Java Programmer, C# Programmer, Project Manager or related title. Some of them obtained jobs as Math Teachers in high schools or teaching programming courses in colleges/universities. IEEE North Jersey Section, a volunteer organization, also benefited from the financial gains \$50,000 running these courses. The money was used to cover many IEEE North Jersey Section activities. The same program may apply to German engineers, since many of the German firms are also outsourcing and downsizing their engineering workforce. Therefore this paper provides a roadmap for international professional societies to retrain their engineers to fit the needs of the modern world.

Business Process Outsourcing (BPO)

Most companies firmly believe that BPO is not just an option but a necessity to survive in the global E-commerce environment, Hsu (2005). A search on Ask.com, Google.com and Yahoo.com yielded millions of matches with BPO. US

Department of Commerce and Forrester (2004) projected 3.4 million service jobs will be outsourced in 2015. Other reports claimed as high as 11 million jobs would be outsourced. Brown and Wilson (2005) did the work on managing the outsourcing challenges. Corbett (2004) identified and selected the right partners for BPO. Hira and Hira (2005) provided thoughtful policy

recommendations for government and business leaders about BPO. Kearney (2004) did a survey of 115 companies, executives responded that India was the leading country (China second) for Information Technology (IT) BPO. Robinson and Kalakota (2004) explained the best practices of the offshore outsourcing. Egypt, Morocco and Tunisia were examined as possible alternatives to India and China, Datamonitor (2005).

India is the leader with 425 IT outsourcing firms. Most US consulting firms: McKinsey, Keane, Kearney, and others have advised clients on BPO. Bank of America, Capital One, EDS, General Electric, HP, IBM, Intel, Oracle, SAP, Siemens, Sun Microsystems, and Texas Instrument, already set up shops hiring 500 to 6000 Indian workers in India. Four major Indian IT firms: Infosys, Satyam, Tata Consulting Services, and Wipro received major outsourcing contracts in billions of US dollars in the past 5 years. Indian Institute of Technology at Bangalore and hundreds of technology universities provided the training ground for thousands of Indian IT professionals. A typical Indian programmer knows about 3 or more programming languages, such as C++, Java, and Visual Basic. Many of them are also versed in Oracle and Unix.

The IT training in USA is at a much smaller scale. About 1.1 million students graduated from 4000+ universities/colleges in USA, 23% of them major in business, one percent (11,000) major in computer science and information systems, (CIS/MIS). Therefore the job market was good for CIS/MIS majors. As the outsourcing continues with rapid pace, it will affect the job prospects of all Americans, especially the ones in the IT field.

Are there benefits of BPO? Yes, all the companies mentioned above. With BPO, US companies keep the costs down and are able to compete globally. Therefore, more jobs are being created and the US economy will actually improve. There were 92 millions jobs in 1983. Even with the loss of manufacturing jobs, there were 130 million jobs in 2006, according to the report from

the US Bureau of Labor Statistics. This is due to the fact the service sectors creating millions of jobs and 1.8 million new workers enter the job market each year which enlarge the base of the US population. Immigration plays an important role in USA job market. Many immigrants from Mexico, central/south America, and Eastern Europe work as laborers off the books (construction, restaurants, and retail). This underground economy is difficult to calculate and is not included in the report from the US Bureau of Statistics. Therefore, the actual jobs in USA should be higher than 130 million, which will put the unemployment rate lower than 5.2%.

Dominican College*

In the Fall Semester of 1988, Dominican College's student population was about 1,400 when this author joined the Division of Business Administration as an Associate Professor in Computer Information Systems. Two Bachelor of Science programs in IT are offered: one in CIS and one in MIS. In the Management area, there are four concentrations: Finance, Human Resource, International, and Marketing.

As of the Fall Semester of 2007, the College's student population is about 1,850, with 40 CIS/MIS majors (2.1%, slightly higher than national average, 1%) and 450+ Management majors. The College is located 14 miles northwest of the New York City. Master degrees are offered in Business Administration, Education, Nursing, and Occupation Therapy. This author served as the Director of the Business Administration Division, from 1990 to 1996.

In 1992, a Business Advisory board was established to revamp the International Management curriculum to include: Global Marketing, International Business, International Finance, and International Management courses. This author taught all of these courses since 1992, Hsu (2003)

Internet E-Commerce became the new paradigm of learning in 1996. Many new courses in CIS/MIS were developed and taught by this author: Internet, HTML, JavaScript, Java Programming and

Advanced Java Programming, Hsu (2002). Global E-Commerce, a new course, was offered in 2000 to address the business side of the E-Commerce. Microsoft Visual Studio 2002 and 2005 were gaining acceptance in the IT development firms. Microsoft Visual C++, Visual Basic and C#. NET courses were offered to meet their needs, Hsu (2004) and Hsu (2006).

(1) IEEE C and C++ Programming course at Jersey Central Power Light:**

ATT Bell Lab developed both of these programming languages. They were used by programmers, application developers and system engineers in the world. Almost all the programs were created using C, then C++, including computer games, IBM DB2, MS Office Suite, Oracle 10g, SAP, Sybase, just to name a few.

In 1992, this author served as a member on the Education Committee of the IEEE North Jersey Section. Due to BPO, there was a need to retrain electrical engineers. The committee decided to:

1. offer a low-cost course in “C Programming” in Spring 1993
2. use the conference room at Jersey Central Power Light, Morristown, NJ, free of charge
3. advertise the course content, using a one-page flyer in the IEEE North Jersey Section monthly newsletter
4. hire this author as the instructor

At Dun Bradstreet* and Dominican College, C Programming was taught by this author many times, using an IBM or compatible PC, with a Turbo C compiler. The PC environment made it easy to learn. In 1980, one could not learn C programming, unless one had Unix operating platform. 27 engineers enrolled and the course went well.

In Fall 1993, C++ Programming was offered at Jersey Central Power Light, with 25 people enrolled. C++ is a superset of C. It means that all programs written in C will be able to run under the C++ compiler, but not the other way around. Using the MS Visual C++ or Turbo C++ compiler, one can

learn on the IBM or compatible PC platform. The course was successful.

Ted Byrne, an independent software developer and the owner of a software firm, continued to offer C++ Programming course and Object Oriented Design course, from 1994 through 2001. This author was not on the Education committee. Therefore, the enrollment data were not known.

(2) IEEE Java and Advanced Java Programming courses:**

Java programming was developed by Sun Microsystems in 1996. In the past 11 years, Java has been the hottest job title in the New York financial firms: Citigroup, CSFB, Goldman Sachs, JPMorganChase, Merrill Lynch, Morgan Stanley, just to name a few. Most of the C/C++ programmers took courses to retrain themselves as Java programmers. The job market has been extremely positive for Java and Advanced Java programmers, with salary level \$45,000 to \$200,000 per year.

Bhanu Chivakula took charge as the Education Committee Chair in 2002. He placed an ad looking for an instructor that could offer new courses. This author replied and was hired. The problem was to find a free location. Bhanu did much search and was able to find BAE system as the local host for this course:

1. offer a low-cost course in Java Programming, Fall 2002
2. use the conference room at BAE systems, Wayne, NJ, free of charge
3. allow three BAE employees (engineers or non-engineers) to take the course, free of charge
4. advertise the course content, using the one-page flyer in the IEEE North Jersey Section monthly newsletter
5. hire this author as the instructor

Twenty six people enrolled (10 from BAE systems). The conference room was equipped with the PC and a computer projector. Every class would start with the theory and discussion. To demonstrate the programming details, this author would

bring his own PC with the Java compiler installed. Then the compilation and execution were demonstrated in class. Many students did the same, bringing their own PCs. Using the free download of the Java compiler from Sun Microsystems (2002), it was easy to learn. Many exercises were done and final projects were carried out.

In Spring of 2003, Java Programming was offered again. Unfortunately, BAE system could not provide a free room. After much effort in negotiation, Bhanu Chivakula decided to use Ramada Inn, Clifton, NJ as the new site. The cost was \$100 per night. Twenty one people enrolled. Many participants raved about the course and requested for an Advanced Java course.

At this point, Ramada Inn was sold and renamed as Wellesley Inn. In Fall of 2003, Advanced Java Programming was given at Wellesley Inn. Nine people enrolled. Each person did a final project: Cold Fusion, Corba, Java Server Page, J2ME, Jini, WebLogic, WebSphere, and XML. They made PowerPoint presentations and demonstrated the project executions. The course did well.

In 2002, many companies in the dot-com business went bankrupt, sold or closed. In the Silicon Valley, the impact of the dot-com crash was felt significantly. Thousands of IT workers lost their jobs. Companies lost millions of investor capitals (cash-burning rate was extremely high) that they had no choice except to close. In the New York area, the do-com crash was bad, but not as bad as in Silicon Valley. As a result, IEEE should offer something different to meet the need of the society.

(3) Project Management at Polytechnic Institute of New York:**

In the 1990s, Massachusetts Institute of Technology, Polytechnic Institute of New York and Stevens Institute of Technology offered the Executive Master Degree program in Technical Management to differentiate themselves from the traditional MBA program. Project Management has been one of the core courses in this curriculum. Since project management is

cross-functional, the project skills learned can be applied to any industry. Companies all over the world started to hire project managers that can handle construction, engineering, environment, finance, human resource, marketing, software or any large/small project. In 2007, project manager became one of the hottest job titles, with 5,000 daily openings listed on Dice.com! Salary in NY firms, ranged from \$80,000 to \$300,000. Hsu and Wirth (1997) reported Japanese management styles, Hsu (2003) completed case studies in Business, Finance, International Management and Marketing courses and Hsu (2004) did case studies in project management and global e-commerce projects. Kerzner (2004) did work on Advanced Project Management. Project Management Institute (PMI 2004) provided the guide for professionals to get certification in Project Management.

In the Fall Semester of 1999, this author taught "Project Management" at Polytechnic University of New York, Executive Master Degree Program in New York City. 36 students enrolled. The textbook by Kezsbom et al (1989), was good for definitions but very outdated. Harvard Business School cases were provided for discussion and research. Project Management concepts were explained in details, including budgeting, change management, critical path method, Gantt chart, milestones, network diagrams, planning, project life cycle, return on investment, request for proposal, statement of work, and work breakdown structure. Communications, financial, conflict, resources, risk analysis, timelines, and training issues were thoroughly examined. A managing director from Bear Stearns gave a presentation on "Managing Financial Projects". Last class was centered on global marketing strategy. Students were separated into 6 groups, with 6 each, for their final project. Each group was assigned a project manager with others serving as project team members. The goal was to develop team building skills. Six final projects were done: Apollo Program, Australian Motors, Automated Baggage System, Human Genome project, Kansai Airport project and Telecommunication Installation. Students did excellent jobs on these projects.

(4) IT Project+ course at Netcom Information Technology:**

Due to the rapid growth of the IT industry since 1980, IT project manager became a hot commodity. Companies spent a lot of money to upgrade IT infrastructure, from MS Window 95, to 98, to XP, to 2003 and to 2007 server. Each of these projects, no longer rested with the IT manager, but with a project manager that might not come from the IT area. Therefore, the IT Project+ is a course to connect these pieces, discussing the use of IT to support all enterprise functions.

CompTIA (2003) developed a series of training manuals for a course in IT Project+, which focused on the Information Technology aspect of project management. One can take the CompTIA exam to get certified as an IT Project Manager. Heldman (2002) was useful for the preparation of the IT Project+ exam.

Netcom Information Technology is an authorized IT training firm in Manhattan, Netcom (2003). The 32-hour course IT Project+ was taught three times by this author in 2003, with a total of 9 students. Many of them were under the Workforce program of the New York State. They got vouchers so they could take courses at Netcom during the period of unemployment. Final projects presented were: IBM WebSphere, Siebel CRM, and Wireless Fidelity Application

(5) Microsoft Project course at Netcom Information Technology:**

The MS Project course was a “hands-on” course, doing exercises in a step-by-step fashion to learn the details of using this software. One created a project from scratch, set up a baseline, imported tasks from MS Excel, generated resource sheet, exported MS Project files to MS Word and employed the Gantt chart for task schedules. One modified custom reports, templates, and combination views. One could then implement a master plan and submitted it to the Project Server, to approve updates and to conclude a project plan. At Netcom Information Technology, this course was

taught three times in 2003, with a total of 8 students. Final projects were: Brass Implementation, Client Contact System and Sparkle Inc (to start a company in the cleaning business). Gantt chart was created for each of these projects using MS Project 2002 software. The installation of MS Project Server 2002 was successful. However, students were unable to access the server. Microsoft Project 2003, 2005 and 2007 were subsequently released. It is difficult to keep up with Microsoft.

(6) IEEE Project Management course at High Performance Technology Inc:**

In Spring 2004, Project Management course was taken by 12 engineers at High Performance Technology Inc (including 2 from HPTI, a defense contractor located in Dover, NJ). This course was sponsored by IEEE North Jersey Section.

The intent was to teach one course that would cover the content of Project Management, IT Project+ and Microsoft Project. Wysocki (2003) was used as the textbook. Many in-class exercises were done: Business Plan, Global Finance, Harvard Business Review cases, Siebel Systems, and World Travel. Students worked in group, one hour per class on these exercises. Final projects were done individually or in a group: Adaptive Project Framework, New Business, New Product Planning, Software Engineering, and UNIX Sun Solaris server at JPMorganChase.

(7) IEEE Project Management course at New Jersey Bulk Mail Center:**

IEEE North Jersey Section sponsored the Project Management course at NJBMC, Jersey City, NJ. The course was offered five times to 47 people by this author, since Fall 2004. Some of them were NJBMC employees. Final projects were: BMC Heating System, BMC Maintenance Operation, BMC Storage, Crane Retrofit, Miami Airport, Microwave Converter, Network Installation, Organizing IEEE Conference, Powered Industrial Vehicle, Second Ave Subway, Security Landing System, Security Master, Software Infrastructure, and TSA Screening, Table 1.

(8) IEEE Project Management course at Elcom Technologies:**

In Fall 2005, IEEE North Jersey Section sponsored the Project Management course at Elcom, another defense contractor located in Rockleigh, NJ. Sixteen Elcom engineers registered and twelve completed the course. Final group projects were: Design Cycle, MS Project Features, Travel Website, and Wide-Band Modulation Frequency Simulator. Many of these final projects were being used in the daily work.

(9) IEEE Marketing Research course at New Jersey Bulk Mail Center:**

In summer of 2004, this author taught a Marketing Research course at the Zicklin School of Business, Baruch College of the City of New York**. The course was offered in the MBA program with 37 students enrolled, Hsu (2006). The same course was offered in Spring 2005, at the New Jersey Bulk Mail Center, with 6 people enrolled. The textbook was McDaniel and Gates (2004). The book was very clear on major topics: marketing research industry, problem definition, research process, secondary database, qualitative research, survey research, primary data collection, measurement concept, questionnaire design, basic sampling, sample size, data processing, statistical testing, bivariate correlation regression, multivariate data analysis, quantitative research, communicating results, managing and ethics issues. A student version of the SPSS software, Version 11 was enclosed with the textbook. Students were able to install SPSS on their home PCs and do the quantitative analysis. Final projects were: New Jersey Bulk Mail Center marketing strategies, marketing plan for a startup and SPSS analysis on a marketing plan.

(10) IEEE C#.NET Programming course at Avtech Institute of Technology:**

Avtech Institute Technology is an authorized New Jersey training firm, Avtech (2006). Microsoft has developed a new programming language C# which is a combination of C++ and Java. It uses some of the syntax that C++ and Java used, but

has many new features. C# is completely compatible with all the Microsoft office products. In addition, with the MS Visual Studio .NET platform, C# becomes the de-facto standard. C++, Visual BASIC, and other programming language, can be used as the input to the .NET platform. C# can be used as the output programming language. This common-language runtime concept is extremely powerful for programming and application development. As a result, the jobs are plenty. Dice.com listed 50 C# daily New York City jobs in 2002 and 370 in 2007. Salary is from \$45,000 to \$100,000.

Avtech provided the computer hardware and software, making it a “hands-on” course which was crucial for learning. MS Visual Studio 2003 version was used with a Visual C# .NET compiler. Several students did the free downloads of the new version, MS Visual Studio 2005 Express Edition. This course was taught three times: 14 enrolled in Spring 2006, 5 in Fall 2006 and 6 in Spring 2007. In Fall 2007, 6 enrolled at AVTI, Hackensack, NJ. Many final projects were directly related to their day jobs, Table 2.

Future Trend

US companies may no longer be competitive. With the US dollar depreciating, British pound and Euro dollar inching higher, opportunities exist for European firms to buy US firms, such as UK Smith Group plc, spent \$1.4 billion buying 8 US firms. Ten of the metro areas from Boise, Idaho to Atlanta, Georgia created jobs in the healthcare and education institutions, Forbes (2005). Displaced workers (engineers and non-engineers) need to get training to find jobs or new locations to work:

- Office support and call center clerks: many of them tend to be younger and make minimum wages. They need to continue their education, by getting a college degree (four-year or two-year). It is a minimum requirement. In a few years, companies may need to hire MBAs because everyone in the firm already has a Bachelor degree

- IT workers: most of them are making salaries \$45,000 to \$80,000 per year. It is certainly higher than the national average, \$42,000 in 2006. To find another high paying job after BPO, it is a major problem. In New York State, there is a workforce retraining program. In 2000, displaced employees got a stipend, \$5000 to \$8000 per year (depending on their residences), to take courses so they could get new jobs. This author taught 300+ of them in courses such as CIW Webmaster, Cold Fusion, C++, Dreamweaver, Flash, Java, JavaScript, and Unix, Hsu (2003) and Hsu (2004). Some of these were sponsored by IEEE North Jersey Section as written in this paper. Many of them did excellent final projects and subsequently found jobs.
- Managers and supervisors: they are making high salary, \$80,000 to \$200,000. Once displaced, it is difficult to find a similar position. The way to survive is skill transfer. Using their background and experience to find similar jobs in another industry. In this paper, training classes in Project Management with IEEE North Jersey section was described. One of them was a design engineering manager with AT&T and lost his job due to BPO. He repackaged himself and was able to find a full-time job as a project manager.
- Entrepreneurs: displaced workers started their own businesses. The most difficult issue is marketing, to find a niche so people will pay you for your product or service. Manufacturing is very costly. Service business is easier to start. Advertising, marketing, use of Internet, focus group, and questionnaire design, become the to-do list. USA remains to be the richest country in the world. China woke up with 1.3 billion potential buyers, Shenkar (2005). European Union (27 countries and 500 million buyers), is the number one consumer market in the world.

With global E-commerce, anyone can set up a website doing international business tomorrow. To make money is a different story. China's Lenovo group bought the IBM's PC unit, creating a \$13 billion global PC company. It ranked third in the world behind Dell and HP. Yet the CEO is Steve Ward, an American, not a Chinese, BusinessWeek (2005). Leonard (2005) predicted that Europe would run the 21st century. With a borderless world (one world meaning one business), the next global stage provided challenges and opportunities for all of us, Ohmae (2005).

Conclusion

Displaced engineers and non-engineers need to take new courses to learn new skills. Team work using project management skills: constant communication, leadership, and ethics will have the best chance of success. Final "hands-on" project provides a new paradigm of learning, Hsu (2007). Global firms benefited significantly from these retrained workers, Table 3.

Since 1993, IEEE North Jersey Section provided 16 low-cost courses training a total 220 engineers/professionals by this author. The collaboration between academia, industry and private firms make it possible to achieve the retraining goals. It generated an inventory of the effective activities, developed the action plan and delivered the end results. IEEE North Jersey Section benefited from the financial gain \$50,000 running these courses, Table 4.

Part of this paper was presented at the IEEE Demand Education conference, Munich, Germany, 2007. Many German firms are also doing BPO. Therefore, this paper provides a roadmap for international societies to retrain their engineers to get jobs in the modern world.

* Full-Time Position

** Part-Time Consultant

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Table 1 **New Jersey Bulk Mail Center**

		Project Managt
#	Name	Final Project
1	Clemente	Software Development
2	Graves	Heating Sysem
3	Pfeiffer	Power Ind Vehicles
4	Subramanian	Security Lending
5	Balossa	Reusable Objects
6	Chan	Forex Trading
7	Cheruvalli	High Avail Cluster
8	Clark	Sorter Overhaul
9	Johns	Benefits Enrollment
10	Koyanagi	Fire Fighting Vehicle
11	Nelson	Intl Securities Lending
12	Roy	Trolltech System
13	Seay	Clarke Sweeper
14	Todoroki	Motorcycle Restoration

Table 3 Companies that sent employees (partial list)

	Table 2	Avtech
		C# .NET
#	Name	Final Project
1	Cies	Sudoku
2	DeMarco	Infrared Imaging
3	Jakal Rinaldi	Dice Rolling
4	Karr	ADO .NET
5	Kemp	Access Database
6	Qin	Optical Scanner
7	Sexton	VStudio 2005
8	Siciliano	Power Computn
9	Kirkland	GUI Website
10	Pinto	Regular Exprns
11	Tempio	Leap Year
12	Zieminski	C++ vs C#

Access Title Agency, Aetna Insurance, Akadema Professional, Alloy Marketing, Asco Power Tech, Automatic Data Processing, Avaya Corp, Avon Products, Bank of New York, Bergen Industrial Supply, Citigroup, Credit Suisse First Boston, Czur Entertainment, DaimlerChrysler, Datascope, Deutsche Bank, Electrophysics Corp, Elcom Technologies, Goldman Sachs Co, Guardian Life, Hertz Corp, Honeywell, IBM, ICIC Bank India, Intel Corp, ITT Co, Jefferies Co, Johnson & Johnson, JPMorganChase, Keane Co, Keyspan Energy, KPMG Inc, Lehman Brothers, Long Island Railroad, Lucent Technology, Merck Inc, Merrill Lynch, MetLife Insurance, Morgan Stanley, New York Presbyterian Hospital, NJ Bulk Mail Center, NJ Transit, Nu Sound Telecom, Oppenheimer Co, Orange Rockland Utilities, Panasonic Computer Solutions, Par Pharmaceutical, Passaic Valley Sewerage Commissioners, Pentax Medical, Pollak Import Export, PricewaterhouseCoopers Inc, Prudential Securities, Salomon Smith Barney, SyncSort Inc, Synergy Microwave, Tilcon New York, Technical Traffic Consultants, Unilever Inc, Union State Bank, United Parcel Service, Verizon Communications, Verizon Wireless, Wallenius Wilhelmsen Logistics America, White Rose Construction, WMC Mortgage Co, Wyeth Pharmaceutical and Yamada International

Table 4 IEEE North Jersey Section
Education Committee
courses taught by Donald Hsu, Ph.D.

<i>Term Yr</i>	<i>Course Title</i>	<i>Location</i>	<i># enrolled</i>
Sprg 1993	C Programming	JCPL	27
Fall 1993	C++ Programming	JCPL	25
Fall 2002	Java Programming	BAE System	26
Sprg 2003	Java Programming	Ramada Inn	21
Fall 2003	Advanced Java	Wellesley Inn	9
Sprg 2004	Project Management	HPTI	12
Fall 2004	Project Management	NJBMC	12
Sprg 2005	Marketing Research	NJBMC	6
Fall 2005	Project Management	Elcom	16
Fall 2005	Project Management	NJBMC	12
Sprg 2006	Project Management	NJBMC	7
Sprg 2006	C# .Net Programming	Avtech	14
Fall 2006	Project Management	NJBMC	10
Fall 2006	C# .Net Programming	Avtech	5
Sprg 2007	Project Management	NJBMC	6
Sprg 2007	C# .Net Programming	Avtech	6
Fall 2007	C# .Net Programming	AVTI	6

Total enrolled ==>>>>>>> 220 !!

Estimated net profit IEEE \$50,076
\$468 per course, 107 people

