



The IEEE

Newsletter

PUBLICATION OF THE NORTH JERSEY SECTION OF THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS

Newly Elected IEEE Fellows

The North Jersey Section IEEE congratulates the following members who were elected to the Fellow grade:

Charles William Lawrence, Charles Lawrence and Associates

"For contributions to engineering and technology management education."

Huifang Sun, Mitsubishi Electric Information Technology Center of America

"For contributions to digital video technologies including coding optimization, down-conversion, and error resilience."

George I. Zysman, Lucent Technologies

"For leadership in the development of mobile communications technology, systems and standards."

Congratulations to the New Senior Members

June 2000

Ivanov, Dentcho
Naguib, Ayman F

August 2000

Allpress, Stephen A.
Doumi, Tewfik
Higinbotham, William
Lotfi, Ashraf W.

September 2000

Lenz, Gadi
Li, Weiqi

November 2000

Lin, Jenshan
Liu, Alfred Zheng
Rose, Richard
Schlicting, Richard D.

You may be qualified to add your name to this list. To get information and an application to advance to Senior Member Grade, give your name and mailing address to: Don Weinstein, Kulite Semiconductor, One Willow Tree Road, Leonia, NJ 07605-2239, (201) 461-0900, ext. 234 mornings, FAX (201) 461-0990, email: don@kulite.com.

NJ MTT/AP Chapter:

3G Wireless Technologies: Fundamentals and Overview

The IEEE NJ Section MTT/S/AP-S Chapter along with NJIT will host a talk February 22, 2001 on "3G Wireless Technologies: Fundamentals and Overview." The speaker will be George Kannell.

About the Talk

This presentation covers the main 3rd Generation wireless technologies from a general overview to details on the technical implementation. It starts with a review of wireless standards and their evolution. Some basic fundamentals that make these wireless systems possible are reviewed. The air interfaces and specifications of these systems will also be compared.

About the Speaker

George Kannell is a Member of Technical Staff in the Wireless Technology Laboratory of Lucent Technologies. Working at Bell Laboratories, he is responsible for the design of wireless digital communication RF systems. He is currently working on 3rd Generation CDMA prototype

equipment. He also teaches courses in Digital Communications as an Adjunct Professor at the New Jersey Institute of Technology. He received his BSEE degree from Fairleigh Dickinson University in 1984 and MSEE degree from the New Jersey Institute of Technology in 1988. Prior to Bell Laboratories, he worked as a Senior Engineer at Ansoft Corporation where he simulated wireless communication and radar systems as well as RF components and software development. Before this, he worked for KDI/Triangle Electronics where he designed wireless components as well as 10 kHz to 20 GHz communications, radar and telemetry subsystems.

All Welcome!

You do not have to be an IEEE member to attend.

Time: 7:00 PM, Thursday, February 22, 2001. Free dinner will be available at 6:00 PM.

Place: New Jersey Institute of Technology (NJIT), Room 202, ECE Center, Newark, NJ. Directions are available at www.njit.edu.

Reservations & Information: Kirit Dixit, (201) 400-2313 (RF Electronics), Willie Schmidt (973) 492-0371 or Edip Niver (973) 596-3542 (NJIT).

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Business Manager.....Theresa Saracinello

Deadline for receipt of material is the 1st of the month preceding the month of publication. All communications concerning editorial and business matters, including advertising, should be sent to the Business Manager via e-mail at k.saracinello@ieee.org or to *The IEEE Newsletter*, c/o Keith Saracinello, 25 Messenger Ln, Ringoes, NJ 08551, (732) 465-4067.

IEEE NJ SECTION HOME PAGE

<http://www-ec.njit.edu/~ieeenj/>

IEEE NJ SECTION NEWSLETTER HOME PAGE

<http://www-ec.njit.edu/~ieeenj/>

NEWSLETTER.html

REPORT ADDRESS CHANGES TO:

IEEE Service Center, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331, (732) 981-0060. It is not necessary to inform the North Jersey Section when you change your mailing address. "The IEEE Newsletter" and other section mailings use a list provided by IEEE's national headquarters.

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The North Jersey Section Executive Committee usually meets the first Wednesday (except holidays and December) of each month at 7:00 PM. Meetings are open to all members. For information on meeting agenda contact Secretary Wayne Owens at (201) 767-3400, ext. 226, wowens@crestron.com.

North Jersey Spring 2001 Student Presentation Contest

The new spring-01 student presentation contest is coming up! The North Jersey Section will be holding a presentation contest scheduled for late-February or early-March of 2001. This contest has been held in years past and its overwhelming success in generating student participation and interest make it a fantastic event for up and coming engineers. This year's contest has also grown. Not only are the prizes (\$\$\$) bigger, but it will have graduate and undergrad categories.

The main focus of the presentation contest is to give students an opportunity to sharpen their communication skills, and help prepare for real life situations as practicing engineers and researchers. Additionally, the North Jersey Section contest provides an excellent chance for students to practice for the Region I Student Paper contest in the spring. This year's regional contest will be held the weekend of April 27th, 2001, at Syracuse University, Department of Electrical Engineering and Computer Science.

The contest at the North Jersey Section level is also supplemented by awarding cash prizes to the three best presentations in both graduate and undergrad categories. All engineering students are encouraged to participate in submitting team or individual presentations on any project work related to engineering. This local contest does NOT require students to write a full paper, just a slide-based presentation on technical or non-technical work is sufficient. Senior design projects, lab projects, personal engineering hobbies, engineering policy, etc., are great topics to submit. Moving onto the regional contest requires submitting a short written paper.

The details of contest rules, judging criteria, viable topics for presentations, and abstract form will be the same as last year. Also if you would like to get an idea of what topics would be appropriate or how you can prepare your abstract, take a look at winners from past years at the NNJ IEEE SAC homepage in the archive section.

This year's North Jersey Section Contest will be open to graduate and undergraduate students and first/second/third place prizes will be awarded in each category of \$100/\$75/\$50. The exact date and time will be announced as they become available. All participants must submit an abstract by filling in the form available at the SAC website to qualify as a contest participant.

Any and all questions can be emailed to the contest organizer, Amit Patel at a.j.patel@ieee.org and check out the website:

http://ewh.ieee.org/r1/north_jersey/sac

The VT Conference Committee Wants You!! Looking for Volunteers, Sponsors, Exhibitors

The IEEE North Jersey Section is hosting the Fall 2001 Vehicular Technology Conference in Atlantic City, NJ from October 6-11, 2001. And now's your chance to get involved.

Have you ever wondered how a conference comes together? How speakers, tutorials, meals, and many other activities are smoothly integrated? How to produce a powerful technical program of international caliber? How to advertise your company's name on the coffee cups during the lunches and breaks?

Then this is the deal for you. The conference committee is issuing an open call for volunteers to help man its sub-committees. Currently the following have some openings: local arrangements, banquet, publicity, publications, registration, special/social events, transportation, and many others.

But it doesn't stop there. There are special discounts for student volunteers and sponsoring companies. What better way for your organization to get its name out to hundreds of people from worldwide in the mobile communications arena than by becoming Platinum, Gold, or Silver sponsors? You can even tailor your sponsorship to meet your advertising needs. This includes getting tables or floor space to exhibit YOUR products and services to those people with the purchasing power or an all electronic advertisement on the website.

Even students can get involved. There is a significant student admissions discount and does not require any society affiliations. We are also looking for students to man the registration desk and take on other activities. Universities are also welcome to become sponsors.

How can you find out more and get involved? Contact conference chair Art Greenberg at a.h.greenberg@ieee.org or (973) 386-6673, and Industry Liaison/Exhibits chair Stephen Wilkowski at swilkowski@lucent.com or (973) 386-6487. Check out the website at <http://www.fallvtc2001.org>.

North Jersey Section Activities

February 2001

Feb. 7–“NJ Section Executive Committee Meeting” – 7:00 PM, ITT, 100 Kingsland Road, Clifton, NJ. Wayne Owens at (201) 767-3400 ext. 226 or wowens@crestron.com.

Feb. 15–“With SiGe, Who Needs GaAs?” – EDS/C&S Chapters, 5:00 PM, Anadigics, 30 Technology Drive, Warren, NJ. David J King (908) 668-5000 Ext. 6644 (dking@anadigics.com).

Feb. 20–Mar. 22 – “Object Oriented C++ Programming” – North Jersey Section, Tuesday and Thursday Evenings, 10 sessions, 6:30-9:00 PM, BAE Systems (formerly GEC-Marconi), 164 Totowa Road, Wayne, NJ. Bhanu Chivakula (973) 751-4879 (b.chivakula@computer.org).

Feb. 19–“Web Caching and Prefetching for Wireless Internet Access” - NJ Communications Chapter, 11:30 AM, NJIT, 202 ECE Center, Newark, NJ. Nirwan Ansari (973) 596-3670 (nirwan.ansari@njit.edu). Please check <http://www-ec.njit.edu/~ieeenj> for the latest updates.

Feb. 22–“3G Wireless Technologies: Fundamentals and Overview” - MTT/S/AP-S Chapter, 7:00 PM, NJIT, 202 ECE Center, Newark, NJ. Kirit Dixit (201) 400-2313, Willie Schimdt (973) 492-0371 or Dr. Edip Niver (973) 596-3542 (NJIT).

Feb. 22–“The Case of the Disappearing Inventor’s Notebook” – NJ Consultants' Network, 7:30 PM, KDI Triangle, 60 S. Jefferson Road, Whippany, NJ. Robert Walker (973) 728-4500 or www.TechnologyOnTap.org.

Upcoming Meetings

Mar. 7–“NJ Section Executive Committee Meeting” – 7:00 PM, ITT, 100 Kingsland Road, Clifton, NJ. Wayne Owens at (201) 767-3400 ext. 226 or wowens@crestron.com.

Mar. 15–“CNG Mass Transit Vehicles” – NJ IAS/PES Chapters, 7:00 PM, Afton Restaurant, Hanover Rd at Columbia Turnpike, Florham Park, NJ. Ken Oexle (973) 386-1156.

Mar. 21–“IEEE Sarnoff Symposium 2001 - Advances in Wired and Wireless Communications” – 8:30 AM to 7:30 PM, The College of New Jersey, Ewing, NJ. Ms. Barbara J. McGivney (732) 280-2022.

Apr. 22–“NJ Section Awards Reception” – at the Birchwood Manor. Reserve this date! Details to follow.

Members and Non-Members Welcome

PLEASE POST

NJ EDS, C&S Chapters:

With SiGe, Who Needs GaAs?

The North Jersey Section IEEE Electron Devices and Circuits and Systems Chapters, in conjunction with Anadigics, Inc., would like to announce the establishment of a joint lecture series. The first lecture will be held on February 15, 2001. Dr. Tak H. Ning of IBM Thomas J Watson Research Center will present, "With SiGe, Who Needs GaAs?"

About the Talk

With SiGe-based bipolar transistors making rapid inroads into high-frequency small-signal and analog applications, there is the question of whether they will permanently displace GaAs or other compound-semiconductor heterojunction bipolar transistors (HBTs). Often the attempts to answer this question have raised more questions because they were based on apple-to-orange comparisons. In this talk, we attempt to make an apple-to-apple comparison of the SiGe and GaAs HBTs by examining and comparing the intrinsic physical properties of the materials and the electrical parameters of these transistors. The comparison is made for devices of comparably advanced structures and of the same design rules. The conclusions are that the commonly practiced SiGe HBT is not really a heterojunction bipolar transistor at all, and that GaAs HBTs are inherently faster than SiGe "HBTs." Therefore, GaAs and other compound-semiconductor HBTs will have a place in applications where the higher speed makes an important difference. The inherent advantage of SiGe bipolar transistor over GaAs HBT lies in its being compatible with CMOS VLSI processing.

About the Speaker

Tak H. Ning received his PhD degree in physics from the University of Illinois at Urbana-Champaign in 1971. He joined IBM Thomas J. Watson Research Center at Yorktown Heights, New York in 1973, where he is currently an IBM Fellow. He has made significant contributions to silicon bipolar, CMOS and DRAM technologies, for which he has been recognized with numerous awards. He is a member of the National Academy of Engineering, and a fellow of the IEEE and of the American Physical Society.

All Welcome!

You do not have to be a member of the IEEE to attend. Refreshments will be served.

Time: 5:00 PM, Thursday, February 15, 2001.

Place: Anadigics, 30 Technology Drive,

Warren, NJ. Directions available at www.anadigics.com/contact.html.

Information: David J King, (908) 668-5000 Ext. 6644, dking@anadigics.com.

NJ Consultants' Network:

The Case of the Disappearing Inventor's Notebook

On Thursday, February 22, 2001, the IEEE Consultants' Network of Northern NJ will present a talk on "The Case of the Disappearing Inventor's Notebook." The speaker will be Michael Friscia.

About the Talk

An analysis of the function and impact of electronic laboratory notebooks will be presented. Electronic laboratory notebooks have streamlined the data gathering and manipulation aspects of research and development, and have provided inventors with a powerful means for quickly storing and retrieving laboratory data in computer-readable form, while minimizing the required administration support. While such innovations are undoubtedly useful to the scientist and inventor, proper notekeeping must still be practiced to ensure that each aspect of the invention is detailed.

Particularly important issues arise in the context of inventors who utilize such electronic means to document aspects of their inventions. Inventors are well advised to document each step of the inventive process, and to have at least one individual witness the inventive concepts as they develop. Traditionally, this process is achieved by having the witness sign each disclosure after it is written down. Accordingly, difficulties arise in the digital realm as inventors must ensure that the information they record is properly witnessed and signed, while still preserved in computer-readable format. This presentation, therefore, will identify some of the important features and solutions that should be incorporated into electronic lab notebook systems utilized by inventors and scientists alike, so that proper documentation and adequate disclosure are realized.

About the Speaker

Michael Friscia has been practicing in the areas of Patent, Trademark and Copyright Law for over 10 years. He is an adjunct professor at Seton Hall Law School where he teaches courses in Patent Law and Trademark Law. He has extensive experience prosecuting patent applications in the mechanical and electrical arts. He is the Chair of the Intellectual Property Section of the Bergen County Bar Association and serves on the Advisory Board of the

Stevens Technology Ventures Business Incubator.

About the Consultants' Network

The IEEE Consultants' Network of Northern NJ was founded in 1992 to encourage and promote the use of independent technical consultants by business and industry.

All Welcome!

You do not have to be a member of the IEEE or of the Consultants' Network to attend. Networking after the meeting is encouraged. There is no charge for admission.

Time: 7:30 PM, Thursday, February 22, 2001.

Place: KDI Triangle, 60 S. Jefferson Road, Whippany, NJ.

Information: For directions and up-to-date meeting status, call Robert Walker (973) 728-4500 or visit our website at www.TechnologyOnTap.org.

NJ PES/IAS:

CNG Mass Transit Vehicles

On March 15, 2001, the IAS/PES Chapters and the North Jersey Section ASME will sponsor a program on the role of compressed natural gas in powering mass transit cruiser buses in New Jersey. The speaker will be Bill Wells.

About the Talk

Running busses on CNG significantly reduces carbon monoxide emissions, reactive hydrocarbons – the principal ingredient in smog and carbon dioxide emissions, which contribute to the greenhouse effect. The program will discuss the successful partnership between NJ Transit and New Jersey Natural Gas. NJ Transit has a total of 77 CNG buses that are in daily use transporting commuters from central NJ to New York City.

About the Speaker

The speaker will be Bill Wells of New Jersey Natural Gas.

Time: 7:00 PM, Thursday, March 15, 2001. Note: this is a dinner meeting and there is a dinner charge of \$15.00 / person.

Place: Afton Restaurant, Hanover Rd at Columbia Turnpike in Florham Park, NJ. Directions: Take I-287 to Exit 37 (NJ 24 East - Springfield). Take NJ 24 East to Exit 2B (Columbia Turnpike). Proceed 2.2 miles to Hanover Road (6th set of traffic lights). Turn left on Hanover Road (Afton Restaurant on the corner).

Information: Ken Oexle (973) 386-1156.

NJ Communications Society:
Web Caching and Prefetching for Wireless Internet Access

On the 19th of February, 2001, the IEEE North Jersey Communications Chapter will co-sponsor a talk on "Web Caching and Prefetching for Wireless Internet Access." The speaker will be Dr. Hisashi Kobayashi.

About the Talk

The system for wireless Internet service provisioning consists of mobile users, push/pull proxy gateways and origin Web servers. The procedure that a mobile user browses or searches his/her desired content is rather complicated. We may have several ways to reduce the total access time: The proxy gateway can cache/prefetch certain content into its storage to satisfy mobile users locally in order to reduce the response delay; the wireless Internet web server can provide dynamic pages with most relevant content and links to a mobile user to reduce the number of browsing/searching steps with the constraint of page size (i.e., limiting the page reading time and page transmitting time in each step). We have investigated how the "mobility tracking model" (based on a semi-Markov process representation of mobile user behavior) and the "request traffic model" (treated as an "emission" from the underlying hidden semi-Markov model) that we recently developed can be applied to prefetch web content for each mobile user for efficient wireless Internet access. We propose a new prefetch scheme that combines access probability, response time and updating cycle to determine the lowest average latency or the highest hit probability. Since the required parameters in our prefetch scheme can be simply derived from the log data of the cache, our scheme can be implemented in practice.

About the Speaker

Hisashi Kobayashi is the Sherman Fairchild University Professor at Princeton University, and served as the Dean of Engineering in 1986-91. Prior to joining the Princeton Faculty in 1986, he spent 19 years with the IBM Research Division at Yorktown Heights, NY, where he was a technical manager in the Applied Research Department and then in the Computer Science Department. In 1982-86, he was appointed the Founding Director of the IBM Tokyo Research Lab., where he directed numerous research projects in computer sciences and engineering.

He is the inventor of a high density digital recording scheme, now widely known as PRML (partial-response coding

and maximum-likelihood decoding). He is an IEEE Fellow since 1977, the recipient of Humboldt Prize from Germany (1979), a Silver Core Award from IFIPS (1980), and Outstanding Contribution Awards from IBM (1971,1973). He was elected a Member of the Engineering Academy of Japan in 1992.

He received his BE and ME degrees from the University of Tokyo in 1961 and 63, and his MA and PhD degrees from Princeton, in 1966 and 67. He worked for Toshiba Co., Kawasaki, Japan as a radar system designer in 1963-65. His current areas of research include transceiver design for wireless communications, communication networks design and analysis, and queuing/traffic theory.

Time: 11:30 AM, Monday, February 19, 2001 (refreshments start at 11:15 AM).

Place: NJIT, 202 ECE Center, Newark, NJ.

Information: Nirwan Ansari (973) 596-3670 (nirwan.ansari@njit.edu). Please check <http://www-ec.njit.edu/~ieeenj> for the latest updates.

IEEE Vehicular Technology Conference

The IEEE Vehicular Technology Society will hold its Fall 2001 Conference on October 6-11, 2001 in Atlantic City. It is one of the major international mobile communications conferences in the world and will be hosted by the North Jersey chapter. Information about the conference is available at www.fallvtc2001.org.

Companies that are interested in sponsorship should contact Steve Wilkowski at swilkowski@lucent.com.

It Pays to Advertise in the Newsletter

Over 5000 readers who are influential in the electrical, electronics, and computer industry receive the IEEE Newsletter each month (except July). These readers represent many companies in the North Jersey area. Included are manufacturers, consultants, sales representatives, universities, and colleges. You can reach this targeted professional audience with your advertisement in the Newsletter.

For information about advertising in the IEEE Newsletter, contact the North Jersey Section Business Manager at k.saracinello@ieee.org, or call (732) 465-4067 after business hours (leave message).

IEEE Member - Get - a - Member Campaign

Recruit new members and get a credit voucher and a chance to win 1 FREE IEEE membership for 2002.

End Date: August 15, 2001

Recruit	US\$ credit voucher amount
1 - 2 new members	a chance to win 1 year of FREE IEEE membership (odds are 1 in 30 for free membership)
3 - 5 new members	\$10.00 + a chance to win 1 year of FREE IEEE membership (odds are 1 in 20 for free membership)
6 - 9 new members	\$20.00 + a chance to win 1 year of FREE IEEE membership (odds are 1 in 15 for free membership)
10 or more new members	One year FREE IEEE membership for the year 2002

Get complete information and the number of membership applications you need by contacting Don Weinstein, Kulite Semiconductor, One Willow Tree Road, Leonia, NJ 07605-2239, (201) 461-0900, ext. 234 mornings, FAX (201) 461-0990, email: don@kulite.com.

Elevation to Senior Member

If you know of members in your Section who have been in professional practice for at least 10 years, you may want to make them aware that they are eligible for IEEE Senior Membership, the highest grade of membership for which an individual can apply. New Senior Members receive a wood and bronze plaque and a credit certificate for up to US\$25 for a new IEEE Society membership. In addition, a letter will be sent to employers, recognizing this new status.

For more information on senior member status, visit

http://www.ieee.org/membership/grades_cats.html#SENIORMEM

To apply for senior member status, fill out an application at

<http://www.ieee.org/organizations/rab/md/smelev.htm>



County College of Morris
November 15, 2000

Lucent Technologies
Bell Labs Innovations



As a part of the annual County College of Morris Career Week, the CCM student chapter visited the Lucent Technologies, Inc. Product Realization Center on November 15, 2000. The visit was made under the direction of the chapter faculty advisors Professors J. Valley and D. D'stefan. The arrangements were made by the student officers E. Balance (VP) and C. Van der Maas (Treasurer). The students were able to observe the design, fabrication and assembly of modern PCS Mobile Telephone Cell Site equipment using CDMA technology.

February Deadline for 2002 Government Fellowships

IEEE-USA will be accepting applications for 2002 Congressional and FCC Fellowships through Feb. 23, 2001. Congressional Fellows spend a year in Washington working on the staff of a Member of Congress or congressional committee. IEEE-USA is seeking an Executive Fellow with background in antennas and propagation, Internet technology, satellite systems and/or software radios to spend a year as an adviser to the Federal Communications Commission's Office of Engineering and Technology. For more information on both opportunities, visit the Government Fellowships webpage at

<http://www.ieeeusa.org/forum/govfel>

or contact Chris Brantley at c.brantley@ieee.org.

IEEE-USA is the career enhancement and technology policy unit of The Institute of Electrical and Electronics Engineers, Inc. (IEEE), the world's largest technical professional organization with more than 360,000 members.



ADVANCES IN WIRED AND WIRELESS COMMUNICATIONS

ADVANCE PROGRAM

Invited Paper Sessions/Chairpersons:

- Advanced Components for Communications / O. Lubecke, Lucent Technologies
- Advances in Mobile Communications / J. Harvey, ARO
- Advances in Optical Communications / J. Lin, Lucent Technologies
- Mobile Cellular Communications / Z. Turski, Sarnoff Corp.
- Communication Filter Technology / R. Snyder, RS Microwave
- Wide Bandgap Semiconductors for Advanced Communication
- Systems in the New Millennium / W. Gelnovatch, GTS
- Advances in Satellite Communications / P. Palena, Lockheed Martin Corp.
- Advances in Programmable Communications / E. Skurnick, Sarnoff Corp

Tutorials/Tutors:

- Bluetooth / R. Schneiderman, consultant

Student Paper/Poster Session:

W. Jemison, Lafayette College, organizer.

DATE: Wednesday, March 21, 2001

TIME: 8:30 AM - 7:30 PM

PLACE: The College of New Jersey, Ewing, NJ

REGISTRATION:

Advance/Same Day: \$125/\$140 (\$10/\$15 student; \$0 life members)

(Registration includes entrance to all sessions and one copy of technical digest;
Additional Digest: \$20)

For advance registration contact Barbara J, McGivney, GTS, LLC, 3100 Route 138, Wall Township, NJ 07719, phone: (732) 280-2022.

Please make checks payable to: IEEE Princeton Section/Sarnoff Symposium

For program updates, symposium news and other announcements visit our web site at
http://ewh.ieee.org/r1/princeton-centraljersey/Sarnoff_Symposium_2001.htm

Sponsored by: IEEE Princeton Section, IEEE Microwave Theory and Techniques Society, TCNJ Engineering Department and TCNJ IEEE Student Branch

IEEE North Jersey Section Course Object Oriented C++ Programming

*Tuesday and Thursday Evenings, February 20, 2001 through March 22, 2001 (No class on Feb. 22)-ten bi-weekly classes
(February 20, 27, March 1, 6, 8, 13, 15, 20, 22 and 27, 2001)
BAE Systems (Formerly GEC-Marconi), 164 Totowa Road, Wayne, NJ
(Checks should not be mailed to this address)*

The North Jersey Section IEEE is offering an evening course entitled "Object-Oriented C++ Programming." The Object-Oriented concept is very widely used today in new design and programming work. Instead of focusing on functionality (what the programs do) it focuses on the natural objects comprising the problem and how they, and their capabilities, are modeled in the program.

C++ is the most widely used language today for object-oriented design and programming. But O-O programming is still programming, so the course will begin with the elements of procedural programs and using C++ as a better C language. It will then move on to Object-oriented programming. The course will cover concepts, implementation and practical aspects of using C++ code.

A knowledge of C programming is not necessary to take the course, but, because neither C nor C++ are elementary programming languages, a familiarity with foundation programming concepts will be very helpful.

TOPICS

1. Review common elements of C and C++: punctuation and key words, variable naming, typing and scope, libraries, text strings, arrays, structures and pointers.
2. C++ procedural programs: conditionals and logical variables, looping and testing, subfunctions and arguments. Debugging.
3. Concept of Object-Orientation: objects and classes of objects, methods and messages, encapsulation and abstraction, overloading of functions and operators, inheritance and polymorphism.
4. C++ improvements to C: new commands and operators, comments, stream I/O. function prototypes, more explicit typing and linking.
5. C++ implementation of objects: what is a C++ object, data and method functions within an object, public, private and friend, static and dynamic objects, constructors and destructors.
6. Encapsulation and abstraction within C++ objects: references and aliases, scope control operator, 'this' object, overloading, functions, operators.
7. Inheritance and polymorphism among C++ objects: parent class or object, extending classes, redefining object data and methods, multiple inheritance.
8. C++ I/O streams: standard I/O, formatted I/O with manipulators, disk and device I/O.
9. C++ library classes and their use: characteristics of a good library class, conversion base classes, video base classes, window base classes, database base classes.
10. Overall program structure with C++ objects: how to lay out a C++ program, how to reuse classes in a program, how to test and evolve a C++ program, how to find errors and debug C++ object programs.
11. Other topics: object-oriented design methodologies, templates and the standard template library, namespaces and interactive program design. Object programs in the Windows environment. Evolution of C++. Commonality and differences with Java.

Class size will be limited to a maximum of 25 with a minimum of 15. Early registration is recommended. Phone reservations will NOT be accepted. Reservations accepted after February 6, 2001 will require a late fee of \$25. No reservations will be accepted after February 13, 2001.

WHERE: BAE Systems (Formerly GEC-Marconi), 164 Totowa Road, Wayne, NJ. (Checks **should not** be mailed to this address)
WHEN: 10 Sessions, Tuesdays and Thursdays, February 20, 27, March 1, 6, 8, 13, 15, 20, 22 and 27, 2001, 6:30-9:00 PM.
COST: With text book or notes: IEEE (& affiliate) members \$300; Non-IEEE members \$400.
CONTACT: Bhanu Chivakula 973-751-4879 (leave message) or email b.chivakula@computer.org

REGISTRATION: OBJECT-ORIENTED C++ PROGRAMMING

To: Mr. Naz Simonelli, 68 Woodmont Drive, Randolph, NJ 07869-3740 (Checks with registration form should be mailed to this address)

Name: / Mr. / Mrs. / Miss / Ms. / _____

Non-member

☞ email address ☞

IEEE Member Member #: _____ Member of _____ technical society

Employer: _____

Employer Address: _____

Home Address: _____

Business (day) telephone #: _____ Home telephone #: _____

Please enclose required fee payable to: **North Jersey Section IEEE**

Registration status will be mailed after February 13, 2001. Phone inquiries concerning registration will NOT be honored. In general, the effective date of the application corresponds to the date when BOTH a fully completed application/registration and payment are received.

Tuition receipt will be mailed only if this box is checked

Signature: _____