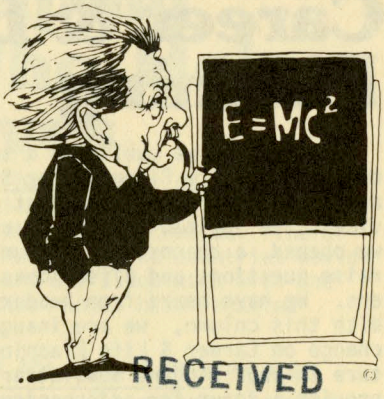
IEEE Student Newsletter

Volume 6, No. 1

October 1977



RECEIVED
MAY 8 1978
AWARDS

Ethics in Engineering

Engineering curricula in general has been likened to a hypothetical medical school in which students are taught about knives and drugs with optional coursework in human anatomy. If technology is the engineer's knife and society the patient, we must fill the void between the two by becoming more aware of the ramifications our actions have on the delicate balance of our societal environment. When negligence or compromise on the part of an engineer tips the balance and produces detrimental repercussions, this constitutes malpractice. The Oath of Hippocrates is a brief, pragmatic set of ethical principles for physicians' conduct. For the engineer, a guideline similar in principle has been established. It is the IEEE Code of Ethics. ed.

###

The engineering student is rarely treated to knowledgeable discussions on professionalism. Even more rarely will the subject of "Ethics" or the ethical practice of the profession be discussed. This is both unfortunate and unnecessary because, despite the fact that there is a lack of subject matter on engineering ethics in engineering curricula, engineering faculty members as a group represent a resource fountainhead for their contribution to the lore of ethical philosophy.

Shortly, you will be an integral part of the profession. As a practioner you must realize that unethical conduct has ramifications far beyond simple dishonesty displayed through cheating and plagarism. Upon graduation you take a giant step from the constraints of a family setting, for which right and wrong are clearly defined, to a more permissive environment in which the issues are more complex and more decisive.

There are several ethical codes with which you may become familiar *(The IEEE Code of Ethics has been reprinted on page 8)*. All have received wide acceptance and, though they differ, they do have several common threads.

We have chosen to discuss specifics of the IEEE Code of Ethics in this and possibly future issues so that you as a student may achieve a better understanding of the Code. Why should we have a code and why should you become familiar with it? The answer can be found in the following:

> "Engineers affect the quality of life for all people in our complex technological society. In pursuit of their profession, therefore, it is vital that engineers conduct their work in an ethical manner so that they merit the confidence of colleagues, employees, clients, and the public. This IEEE Code of Ethics is a standard of professional conduct for engineers."

This is the Preamble of the IEEE Code of Ethics. The underscoring of key phrases are the author's and endeavor to point out the salient attributes of the code.

Before going into the specifics of everyday usage, let us first examine the impact of ethical behavior on you and your lifestyle. Ethical practice is a personal and subjective matter. Mario G. Salvadori, a distinguished member of the profession, stated in an address[1] to a group of eminent engineers, "...ethical behavior is the result of the intimate dictates of one's conscience." An individual's desire to depart from or adhere to the mores of peer group philosophy is subject to intense internal and external pressures. Perhaps this alone is responsible for adherence to the various ethical codes by most practicing engineers.

Questions you must face throughout your life, both in looking back on your past as well as ahead to your future will include: How did/will your peers measure you as a person? How did/will your conscience contend with your actions? One small town newspaper editor in a recent editorial[2] on the alleged ethical misconduct of a U.S. Congressman said ethical codes are "...something honest men seldom need. But then, there are men who consider themselves honest, but do things other men consider suspicious". As you fill out your employment resume and present yourself to a potential employer, you may find that the job which may determine your ultimate destiny hinges on the interviewer's perception of your integrity.

Professor Salvadori in this same address also said, "One may wonder, therefore, whether engineers need in their profession a specific code of ethics that goes beyond the unwritten codes ruling them as citizens, members of a community, or a denomination."He answered quite persuasively by saying, "I personally believe that engineering codes are needed for the simple reason

(continued on page 7)

Idea Exchange on Career & Life Planning

Last year, we published a series of four articles on Career & Life Planning for Students which is now available as a single booklet from IEEE Student Services. We invited readers to request information and we opened a channel of communication with them to raise questions and offer ideas for sharing with others. We have heard from readers all over the world. With this column, we are inaugurating the "Idea Exchange on Career & Life Planning" as a regular feature in your Student Newsletter. Our purpose is to provide a forum for discussion, raise awareness in students of career planning realities and provide opportunities for clarifying problem areas through questions and answers.

Question: I enjoyed your article on "Goal Setting". I am planning to change my career activities from academic research to instrument manufacturing venture. Can you suggest any good references pertaining to starting and managing a small business?
M.S.R., Fredericton, N.B., Canada

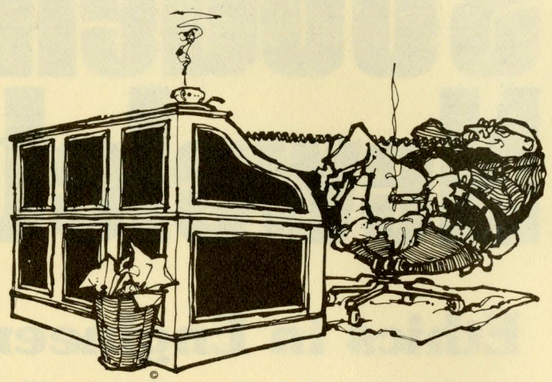
Answer: One of the best buys in this area is Up Your Own Organization by Donald M. Dible, Entrepreneur Press, Santa Clara, California, 1974. It is also available in paperback and has an extensive bibliography to consult for additional details.

Question: I have found, in studying your four articles, increased motivation and direction with both my graduate studies and extra-curricular activities. I have now worked out my long-term goal. I am wondering, however, if it is good to formulate your (life) goals in such a way that they cannot be fulfilled?
P.K., Victoria, Australia

Answer: A life goal is that which gives your life meaning, purpose and direction. In a sense it cannot be completely fulfilled. Yet it must be phrased in a way which enables you to formulate specific immediate objectives based on careful analysis of current realities; these objectives must be relatable to your life goal and indicative of the results you are striving to achieve in a certain time frame.

Questions? Write John G. Picarelli, IEEE Career & Life Planning Project, Washington International College, 1239 G Street, NW, Washington, DC 20005.

Already Hard At Work!



Human Race #3

The IEEE is recognizing the top Student Branches in the world through the Human Race-- an annual membership contest between the 430 Student Branches.

Awards will be given to the top 10 Student Branches in the following categories:

(1) Largest absolute growth between August 31 and December 31;

(2) Largest relative membership growth between August 31 and December 31.

First Prize in each category will be a RCA CDP18S020 Microprocessor Kit plus a one year subscription to the 36 IEEE Transactions.

Second Prize will be a RCA COSMAC Microtutor II plus a one year subscription to the 36 IEEE Transactions.

And many more prizes! Official rules and guidelines are available from IEEE Student Services Department.

Note: A Branch must have 10 or more students as of 8/31 to be eligible.

Student Branches south of the equator or those whose academic year begins in another part of the year should write IEEE Headquarters before 12/31 for special arrangements for growth period calculations.

IEEE STUDENT NEWSLETTER is published quarterly during the academic year by the Institute of Electrical and Electronics Engineers, 345 East 47th Street, New York, New York 10017. Material may be reproduced without permission, although credit to the source is appreciated. Annual subscription: IEEE Student Members, included in membership dues; other IEEE members $3.00 (single copy $1.00); all others $6.00 (single copy $2.00). Change of address requires thirty day notice to IEEE. Editor: Richard M. Aseltine

Second-class postage paid at New York, NY and at additional mailing offices.

A new Manager of Student Services will be coordinating the IEEE Student program and editing the STUDENT NEWSLETTER. Richard Aseltine joined the IEEE Headquarters staff in August.

Richard has a long record of involvement in student-oriented activities. He served as the Chairman of the IEEE Student Branch at the University of Tennessee during the 1975-1976 academic year. During the course of his college career, Richard tried his hand at almost every IEEE student activity at least once including authoring a Student Paper, co-authoring a Bendix Proposal, writing for the Branch newsletter entitled RANDOM NOISE, submitting a Fortescue Fellowship application, attending Section meetings and Regional conferences, not to mention the after hours socializing involved with each.

Upon graduating from UT in June of 1976, Richard was employed by SCORE, Inc. (Student Competitions on Relevant Engineering) based at M.I.T. SCORE, as all you avid Newsletter readers know, was written up in the last Newsletter (April/May 1977) for sponsoring the Energy Resource Alternatives II intercollegiate engineering competition.

Branches: 430 Chapters: 10

In September, 1975 the IEEE Board of Directors approved amending the Bylaws to allow the formation of technical subunits of Student Branches -- Student Branch Chapters. The Chapters are encouraged and nurtured in their technical specialties by the IEEE Groups/Societies. Hence, they provide unique programs and services for students in the technical area while maintaining their affiliation with the local IEEE Student Branch.

A number of Computer Society Student Branch Chapters have been formed. They include:

Arizona State University
Michigan Technological University
University of Missouri - Columbia
University of New Mexico
University of Pennsylvania
Polytechnic Institute of New York
University of South Florida
Texas A&M University
University of Texas at Austin
Wayne State University

While the Computer Society is the only unit which has taken advantage of this opportunity to reach students thus far, interest is growing among other Groups/Societies. For those of you who are interested in this aspect of the IEEE Student program, the Student Branch Operations Guide Supplement has been prepared to serve as a handbook for IEEE Student Branch Chapters. It is available by writing to IEEE Student Services, 345 East 47th Street, New York, New York 10017. For more information on the Computer Society Student Branch Chapters, write to: Computer Society Student Activities Coordinator, P.O. Box 639, Silver Spring, Maryland 20901.

IEEE: Helping Those Who Help Themselves

IEEE Student program has a number of goals, none of which can ever be realized without active involvement of the members for whom it was created. There are over 25,000 Student Members in 31 countries worldwide. Most of those members are associated with one of the 430 Student Branches which have received Charters.

The major purposes of the Student program are:

- to provide an awareness of the scope, opportunities, and direction of the profession, expectations of and professional responsibilities held by engineers, and concepts of professionalism not normally taught in formalized classes.
- to provide an awareness of the nature and scope of the IEEE and the many and varied opportunities for either active involvement in the dynamics of the organization or passive reception of its services.
- to present opportunities for participation that contribute to a student's educational, technical, and professional development in preparation for entry into the profession.

Yet, regardless of what the Institute does in providing opportunities, each individual member is responsible for what he/she gets out of her experience. The IEEE's concern is for YOU; as a Student member your dues are subsidized by IEEE. The most tangible evidence of benefit you may perceive from membership may be your monthly issue of SPECTRUM and the quarterly STUDENT NEWSLETTER... but the actual services go far beyond that, especially those who utilize to the utmost what the IEEE has to offer. Instead of skipping a Branch meeting to go to the student center to play hearts, show up at the meeting -- you might learn something. If you feel the meetings aren't productive and could be improved, volunteer to help organize the next meeting and shape it into what you feel it should be. That's a beginning.

Next, write a paper for the Student Paper Contest or work on a Bendix proposal. Most English courses never taught you how to write a technical paper, but your faculty advisor will help you understand the mechanics of what is required. When you submit your paper, it will be reviewed by qualified engineers. If you want to know whether you can write, try it, you may like it. You may even win the contest or Bendix Award and receive the recognition and cash awards that go along with them.

The IEEE can do even more for you if you are interested. Attend a Section meeting or go to a Regional conference. Enroll in a short course sponsored by the Institute or check out one of the home-study courses. Join a Group/Society and receive the state of the art updates as things develop. (Textbooks are usually 2-3 years behind the times in frontier technology). Participation in any of the above activities means more exposure to the spectrum of electrical engineering which in turn makes you a better-rounded and better educated engineer than the thousands of people who aren't taking full advantage (or who aren't even members) of the IEEE.

IEEE Vincent Bendix Award

Cash for a Cause

If you have grandiose plans for beginning a crusade to solve one of society's myriad of problems or just want to chase windmills and need some cash to get things underway, the IEEE once again has the answer.

Simply get a group together from your Student Branch to help write a proposal for the annual Vincent Bendix Award, submit it before the November 15 deadline following the format outlined in the Bendix Proposal Flyer and you may be on your way to explore new horizons. Proposals may be of either a technical or non-technical nature, so there's no excuse to pass up a great opportunity.

Most of you have no idea of how much paperwork one must endure in obtaining a grant from federal or private organizations (ask your professors if you are curious). Well, the IEEE is ahead of the times in encouraging conservation of timber resources, not to mention energy and postal employees' shoe leather, by requiring that the proposals be a MAXIMUM OF SIX PAGES IN LENGTH!

All we require is that your proposal show evidence of how your project, if funded, will strengthen the professional development of the students involved and how it will contribute to the development of your Student Branch's program. We've served the ball, now it is time for you to return it ... so get busy now if you haven't already written a proposal. More details are available from your Student Branch Chairman or IEEE Counselor.

Judging Criteria

Bendix proposals are evaluated by a subcommittee of the Student Activities Committee. The judges carefully consider each proposal and scores it on the basis of:

(1) How well the proposal was written;

(2) Whether it was properly researched and documented;

(3) Whether the project is both practical and feasible;

(4) The potential for student involvment.

Rules

Each Student Branch may submit one proposal a year.

Proposals may be technical or non-technical in nature but must be imaginative, likely to contribute to the students' professional development, and serve to strengthen the Student Branch program.

Goals should be stated and evidence should be given to indicate that a number of Branch members will be involved.

Four legibly reproduced copies of the proposals should be sent to the Student Services Department of the IEEE and must be postmarked no later than November 15.

Winning Branches are required to submit brief progress reports as requested in addition to an interim report and a final report.

Suggested Format

Page 1: Should contain the title of the project, the name and address of the Branch, names of the students who prepared the proposal, and the faculty advisor's signature. The total amount of funding requested should also be noted.

Page 2: Should contain an abstract of no more than 100 words which clearly summarizes the proposed activity.

Page 3 - 5: Should contain a clear, concise statement of the proposed project indicating how the goals are to be achieved. Explain how many students will be involved and describe job responsibilities. A timetable and complete bibliography should be included.

Page 6: Should contain the proposed budget(Wages not allowed).

Perhaps the most difficult part of writing a Bendix proposal is preparing the abstract. To give you an idea of what a few of the past winners wrote, below are reprints of a few of the 1976 award winners:

Non-Invasive Cardiac Rate Monitor

The object of this proposal is to effect the design of a versatile NON-INVASIVE CARDIAC RATE MONITOR. Designed for use in psycological experiments, clinics, hospitals, and out-patient environments, this device is to feature a digital method of rate conversion and display while observing such considerations as ease of operation, safety, and portability.

Operating over a range of 30-200 beats per minute, this device is to possess internal calibration capabilities, low power consumption, and will utilize dry wrist electrodes.

This proposal seeks funds to purchase the parts and materials for the construction of a prototype.

Design and Construction of a PC Board Facilty

Printed circuit board facilities are essential to the fabrication of permanent hardwired circuits. There are no PC facilities on campus at Colorado State University.

It is proposed that a printed circuit facility be constructed and maintained by the CSU Student Branch of the IEEE. The benefits of such a facility would be:

(1) Provide students with a valuable facility with which to develop professional skills;

(2) Encourage underclassmen, who have poor representation in IEEE, to develop more interest through services provided by IEEE; and

(3) Give members valuable experience in design, construction and material acquisition for the facility.

This proposal summarizes the design, manpower requirements, and expenditures required to construct a printed circuit board facility.

Microprocessor Evaluation System

A number of microprocessor LSI parts are presently available. In particular, Motorola offers for students a low priced set of parts which, unfortunately, is not complete. This proposal is aimed at completing the portions that are lacking in that inexpensive group of parts and integrating them into an economical microcomputer system utilizing components which are readily available to the student at a reasonable price. This will include building a prototype and producing a manual for future builders.

In 1976, twenty-two teams of IEEE Student members vied for Vincent Bendix Award grants. Of these, the eight most outstanding were funded for a total of $3,130. The projects which were funded were:

University of North Dakota
"Non-Invasive Cardiac Rate Monitor"

Colorado State University
"Design and Construction of a Printed Circuit Board Facility"

University of Detroit
"Digital ECG Arrhythmic Monitor"

Drexel University, Day Division
"A Speech Processing System for Isolated Word Recognition"

University of South Florida
"Microprocessor Evaluation System"

Youngstown State University
"Microprocessor - Based Pattern Recognition as Applied to Track Event Timing"

University of Akron
"DATA-NET"

University of Wyoming
"Design and Construction of a Two-Way Communication System for Video and Audio Signals over a Fiber Optic Transmission Line"

If you are hesitant about writing a proposal because "the odds are against getting funded," consider this: in the past 4 years we have funded twenty-eight of the seventy-three proposals submitted... one out of three, the odds aren't bad!

To give you an idea of the type of projects which have been funded in the past, we pulled the titles on a few of those 28 winners:

"Amateur Radio Station"
"Grain Moisture Analyzer"
"Versatile Telephone Communicator for the Deaf"
"Video Graphic Display System"
"Lite-Sign"
"A Satellite-Tracking System"
"Audio-Manual Tracking"
"IEEE Education in Electrical Engineering"
"Speech Frequency Analyzer"
"Motorized Wheelchair"
"Satellite Navigation Project"
"A Home Lighting Control System"
"Biological Cell Counter"

Bendix Proposal Submission Deadline: November 15

MIDCON Opportunity!

For the first time the IEEE Region 4 Student Conference is being held at the same time and same place as MIDCON. Combining the two has the promise of providing you, the student, with an exciting educational opportunity you cannot afford to miss!

The Student Conference will be held on Tuesday, November 8, 1977 at the Hyatt Regency O'Hare/O'Hare Exposition Center in Chicago. There will be a morning session devoted to the IEEE Student Program, an afternoon seminar on microprocessors, and an evening Rap Session between IEEE President Robert Saunders and the membership-at-large.

Students attending the Conference will be given free admission to the MIDCON exhibit hall.

Fortescue Fellowship

Funds have been made available for a Charles LeGeyt Fortescue Fellowship for 1978-1979. The one-year $5500 award will be made to a full-time postgraduate student in the field of electrical engineering. Preference will be given to applicants about to begin their first year of graduate work.

Candidates for the Fortescue Fellowship should file application on the forms provided by IEEE so that they reach the Fellowship Committee by January 15, 1978. Applicants are required to take the Graduate Record Examination and should arrange for the scores to be sent to the Fellowship Committee by January 15. Awards will be made as soon thereafter as possible. Copies of the application forms are available at many colleges or may be obtained from Ms. Una B. Lennon, Staff Secretary of the Awards Board, IEEE Headquarters, 345 East 47th Street, New York, New York 10017.

IEEE Press on Microprocessors

The publication of MICROPROCESSORS: Fundamentals and Applications, A Book of Selected Reprints, has been announced by the IEEE PRESS. This collection was edited by Wen C. Lin of Case Western Reserve University.

Few areas of technology have been unaffected by the appearance of the microprocessor, and its impact will be felt increasingly as fresh developments occur and new applications are made. It is thus more important than ever that engineers, scientists, students, and managers familiarize themselves with at least the fundamentals of the operation and application of computers in general and of microcomputers, in particular.

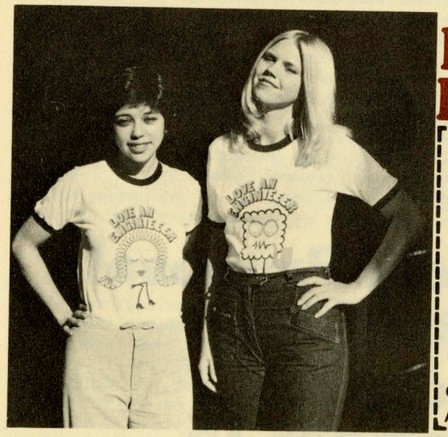
The express purpose of this book is to aid those readers who are weak in computer fundamentals to gain an understanding of how micro-processors work and how they are being applied in system design and instrumentation.

The 43 reprinted papers are arranged by subject category into four parts. The first part contains introductory papers giving general information on microprocessors. In the second part, the reprints cover architecture, software, interface, system development aids and testing. The papers in the third part describe some of the myriad applications of microprocessors, while those in the fourth part are concerned with assorted topics, including the use of microprogramming techniques as a bridge between hardware and software engineering.

Especially useful to the computer novice is a glossary of computer terminology. A categorized bibliography is included for those who may wish to delve more deeply into any aspect of the microprocessors.

This 344-page volume, sponsored by the IEEE Computer Society, is priced at $9.95 for the paperbound member edition. A clothbound edition is available for $19.95 (discounted to $14.95 for IEEE members).

This book can be ordered postpaid from the IEEE Service Center, 445 Hoes Lane, Piscataway, New Jersey 08854. Payment should accompany the order.



IEEE T-Shirts — Order a Bunch for the Branch

Order Form—Send to IEEE Service Center, 445 Hoes Lane, Piscataway, New Jersey 08854

Specify Quantity Each Size:

1 - 9 Quantities: $3.75 each

10 or More Quantities: $3.25 each

Mr. Cyril Circuit:

S	M	L	XL
☐ TT01032	☐ TT01040	☐ TT01057	☐ TT01065

Ms. Cheryl Circuit

S	M	L	XL
☐ TT01081	☐ TT01099	☐ TT01107	☐ TT01115

Quantity Ordered: _____

Amount Enclosed: $ _____

Ship To:

Name (Type or Print) _____

Address _____

City State/Country Zip _____

Make checks payable to IEEE. New Jersey Residents add 5% Sales Tax.

Allow 4 Weeks Delivery

Ethics Cont'd From Pg. 1

that in our technological culture, the power of the engineer is all pervading and can adversely affect the lives of innumerable members of the society. Just as, in those societies in which the priest caste was all powerful, the members of the priesthood were subjected to the most rigorous strictures of the religious moral codes, the engineers today must be made aware of his enormous responsibilities in shaping society through his technological power and must be ethically restricted. More so, because his actions were surrounded by the mysteries of science and those of the priests were surrounded by the unknowledgeable mysteries of religion."

To give meaning to the Code in everyday usage, a few applications may be useful:

The acceptance of responsibility and the full disclosure of facts reflects personal integrity and is an asset to the engineer. In a recent review of possible ethical infractions, an engineer heading a city works department directed that plans and specifications prepared by a recognized firm not be identified on bid requests and that such advertisements reflect their preparation by the city department. Both the element of responsibility for the designs and the lack of disclosure (in reality, false identification) of the origin are specific issues involving ethics. A referral to the Code will indicate not one but several specific sections in each Article of the IEEE Code to be applicable in the example cited.

Is this an unusual case? - No. The opportunity for indulging in such behavior may be commonplace, but the lack of incidents is the result of engineers adhering to the basic principles of the profession.

Another idea of unethical opportunity arises from the use of "free engineering" which may become available from manufacturers in the course of their sales activity. Where does this practice fall afoul of the Code? In several ways the issue revolves around Article III in that the engineer must take full responsibility for use of such designs and specifications, particularly if they are of the customized variety frequently available from a manufacturer or representative as a result of computer technology. In addition to his responsibility for the data itself, the engineer places himself and his employer in a conflict of interest situation through potential obligation for receiving such gifts or services. If the manufacturer's representative is also an engineer, he likewise is treading on the ethics issue by his offer of the services under questionable circumstances.

Engineers who participate in technical society activities are often confronted with issues relating to their work. This, of course, impinges on Article III, Section 2 of the IEEE Code of Ethics. Young engineers may find this of interest and should carefully assure themselves of the rules and procedures of their employer in his regard. Article II, Section 2 places, however, the obligation on an engineer, within appropriate limits, to disseminate information freely. While these appear in opposition, the point is made that the Code is intended to stimulate as well as constrain and in this sense, personal judgement becomes the crucial element.

Micro Mouse Maze

First there was Mickey, then Mighty, now the IEEE SPECTRUM has created Micro -- Micro Mouse that is.

The Micro Mouse contest challenges IEEE members to build a self-contained "Mouse" which can find his way through a maze with no assistance from his owner.

The official rules and guidelines will be published in SPECTRUM, but here is a sneak preview of what to expect:

- The maze will consist of elbows (L), tee's (T), U's (⊔), straight runs and deadends (mouse traps).
- There will be more than one path which will lead to the exit.
- Shortest path from start to finish will be 217 inches.
- Two training runs will be allowed, but no alterations may be made once a preliminary trial has been run.
- Guidance by lights or ultrasonic sounders is prohibited.
- Locomotion methods are the option of the builder; turning around and backing up is allowed.

Awards will be given for the best maze-running time after two preliminary runs as well as for the fastest first trial time.

The entry fee is $3.95 and entrance forms are available by writing to IEEE SPECTRUM, 345 East 47th Street, New York, New York 10017.

The issue of fairness is prevalent throughout the Code and in particular, Article II. The changing patterns of society make this a demonstration for the young engineer to translate college relationships to a non-academic environment. Here is a different set of values thus creating the burden of making more than subtle adjustments. The code, as a repository of human character distillation, can offer a crystalization of prior and serious thought.

Many codes have evolved a set of precedent guidelines or interpretations which serve as the body of comparison for alleged infractions. Adjudications are tempered conspicuously with past evaluations and judgements. Conflict of interest cases related to all codes are rampant with interesting and sometimes humorous introspections into the applicability and contravention of the specific wording. Read the IEEE Code as you read the Sunday comics - secure for yourself that simplified and concise articulation of man's best instincts. It is full of breadth and depth for those who choose to understand, study and apply its true intent.

--W.W. Middleton, P.E.
Past Director, IEEE
Past Chairman, Ethical Practices Committee, NSPE

References:
1 ASCE Conference on Ethics, Professionalism and Maintaining Competence, Ohio State University, March 10-11, 1977.

2 Bedford, Pennsylvania Daily Gazette, March 5, 1977.

IEEE Code of Ethics for Engineers

Engineers affect the quality of life for all people in our complex technological society. In the pursuit of their profession, therefore, it is vital that engineers conduct their work in an ethical manner so that they merit the confidence of colleagues, employers, clients and the public. The IEEE Code of Ethics is a standard of professional conduct for engineers.

Article 1

Engineers shall maintain high standards of diligence, creativity and productivity, and shall:

1. Accept responsibility for their actions;
2. Be honest and realistic in stating claims or estimates from available data;
3. Undertake engineering tasks and accept responsibility only if qualified by training or experience, or after full disclosure to their employers or clients of pertinent qualifications;
4. Maintain their professional skills at the level of the state of the art, and recognize the importance of current events in their work;
5. Advance the integrity and prestige of the engineering profession by practicing in a dignified manner and for adequate compensation.

Article II

Engineers shall, in their work:

1. Treat fairly all colleagues and co-workers, regardless of race, religion, sex, age or national origin;
2. Report, publish and disseminate freely information to others, subject to legal and proprietary restraints;
3. Encourage colleagues and co-workers to act in accord with this Code and support them when they do so;
4. Seek, accept and offer honest criticism of work, and properly credit the contributions of others;
5. Support and participate in the activities of their professional societies;
6. Assist colleagues and co-workers in their professional development.

Article III

Engineers shall, in their relations with employers and clients:

1. Act as faithful agents or trustees for their employers or clients in professional and business matters, provided such actions conform with other parts of this Code;
2. Keep information on the business affairs or technical processes of any employer or client in confidence while employed, and later, until such information is properly released, provided such actions conform with other parts of this Code;
3. Inform their employers, clients, professional societies or public agencies or private agencies of which they are members or to which they may make presentations, of any circumstances that could lead to a conflict of interest;
4. Neither give or accept, directly or indirectly, any gift, payment or service of more than nominal value to or from those having business relationships with their employers or clients;
5. Assist and advise their employers or clients in anticipating the possible consequences, direct and indirect, immediate or remote, of the projects, work or plans of which they have knowledge.

Article IV

Engineers shall, in fulfilling their responsibilities of the community:

1. Protect the safety, health and welfare of the public and speak out against abuses in these areas affecting the public interest.
2. Contribute professional advice, as appropriate to civic, charitable or other non-profit organizations.
3. Seek to extend public knowledge and appreciation of the engineering profession and its achievements.

THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.
345 East 47th Street, New York, New York 10017