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ENGINEERS' FORUM

VOLUME 19 • NO 4

DECEMBER • 2000

How To Engineer a Tan

It looks good on you!

Being the Best...

with Dr. Griffin and Engineering

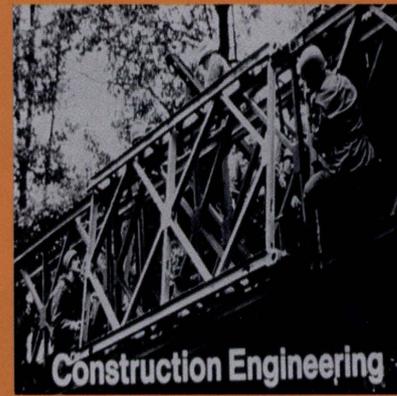
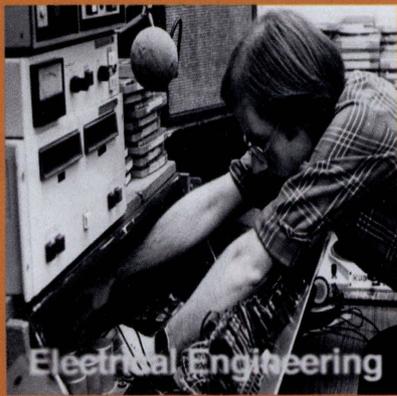
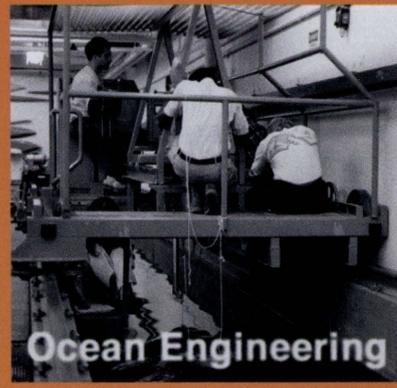
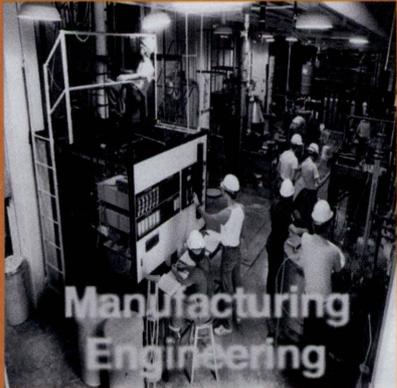
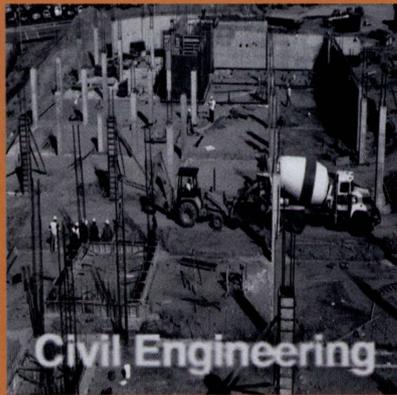
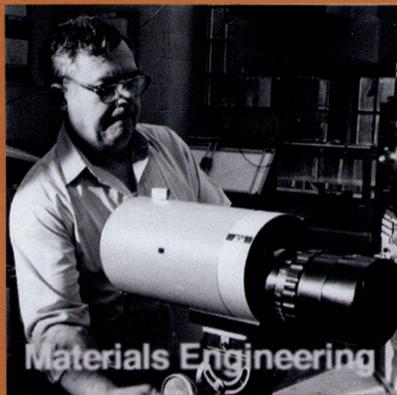


Inside • NEB no more • SWE

JOIN THE FORUM. WE ARE ALWAYS LOOKING FOR NEW STAFF MEMBERS. WHETHER YOU'RE IN ENGINEERING OR NOT WE HAVE A POSITION FOR YOU! OPENINGS IN WRITING, PHOTOGRAPHY, GRAPHIC DESIGN, MARKETING, AND MANAGEMENT ARE ALL AVAILABLE AND LOOK GREAT ON A RESUME.

ENGINEERS' FORUM

**NOT
REQUIRED.**



MEETINGS

5 PM Mondays in Norris 329

ENGINEERS' FORUM

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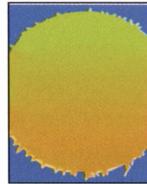
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Editor's Note

Happy Holidays!

I hope that this reaches everyone out there in Tech land. It seems like Thanksgiving break was a lifetime ago, and we are ready for another week off.

Here we are, perched on a precipice some of us know all too well...final exams. sigh. I guess the only advice that I can give you is to remember to get plenty of sleep and don't leave that studying until the 5 minutes before your test. Then again if you are reading this, you are probably procrastinating anyways. So I guess we'll have to entertain you somehow, somehow, because I know you don't want to get back to those evil books.

The Society of Women Engineers has given us a great article telling all about the great things that SWE does. Visit the SWE website for more information.

Professor Griffin talks about the rewarding aspects of engineering, and why the road to that degree is a long and tough one (but definitely worth it).

And for all you beach bums: grab your beach towels and sunglasses and head to the...tanning salon? Tom will lead you to a perfect bronze tint.

Hang in there, good luck on exams, and enjoy the break...we'll be back here before we know it.

JOHN P CRUZ

Managing Editor

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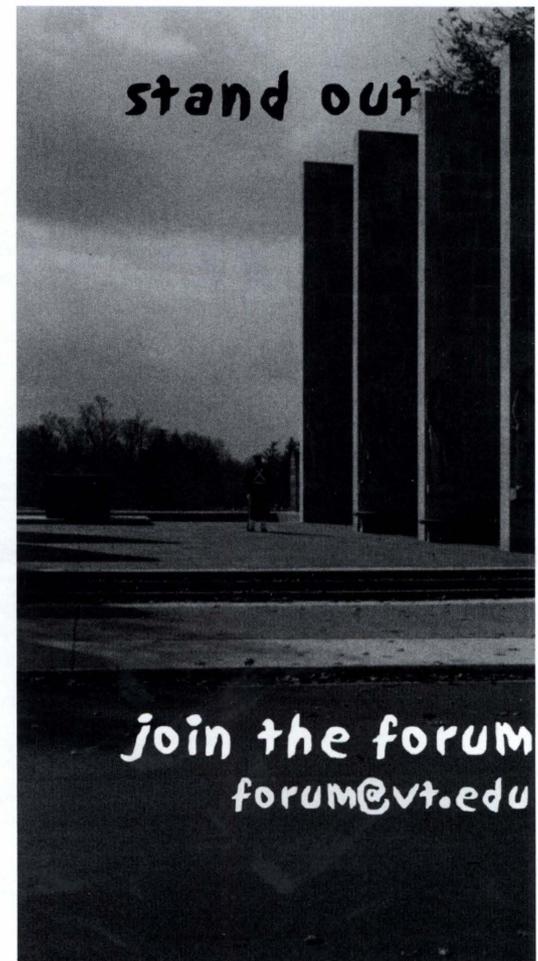
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Being the Best Isn't Easy

By O. Hayden Griffin, Jr.

Professor and Director

Division of Engineering Fundamentals

If you're reading this, the chances are that you are either already a member of the Virginia Tech College of Engineering or you would like to be. Our college is rated by academicians, recruiters, and engineering administrators as one of the best in the United States. Our faculty are acclaimed worldwide as leaders in their fields, our students are recognized as among the very best, and our graduates are highly sought after by

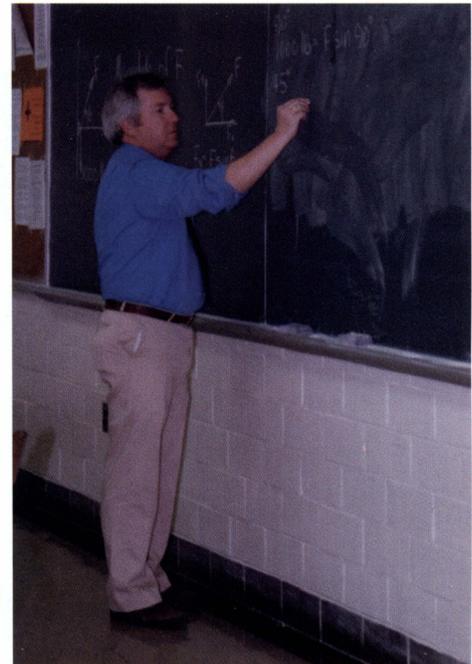
but it certainly motivated us to study. For the past decade, the success rate of General Engineering students at Virginia Tech has been approximately 75%, which is exceptionally high compared to the national success rate of approximately 50%. We believe that the success rate is so high because we are fortunate to have a highly qualified group of students and also because our programs are designed with student success in mind. All of our

Becoming an engineer has never been easy and probably never will be.

graduate schools and employers.

Becoming an engineer has never been easy and probably never will be. Years ago, new engineering students were told, "Look right, look left, and only one of you will be here at graduation." I'm not sure the attrition rate was ever that high,

degree programs underwent substantial review during 1995 and 1996, with the changes implemented in 1997, and we are constantly assessing courses as well as student outcomes to make sure the curriculum is working. We want you to succeed in your quest for a Virginia Tech



engineering degree!

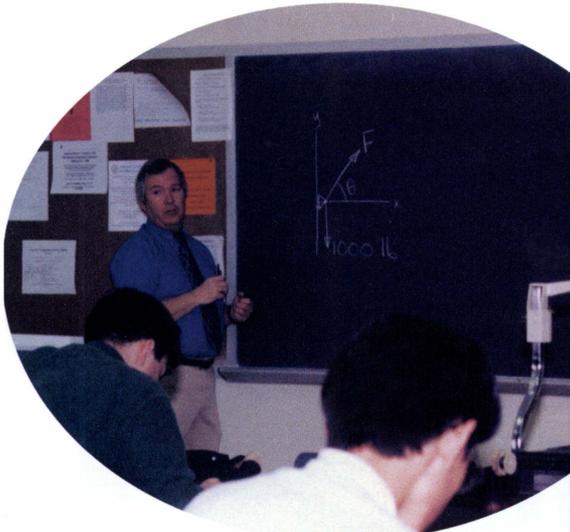
The relationship between engineering faculty and students is very complicated. I have come to realize that students are simultaneously our customer and our product. As they reach their senior year and possibly attend graduate school, they take on the additional roles of colleagues, and sometimes friends. When they leave the university, they are still our colleagues and friends, as well as our product, and they are often again our customers as they return to hire more current students or fresh graduates.

As student "customers," individuals (and often their parents) have a right to expect quality instruction, meaningful laboratory experiences, equitable treatment, good advice, and a host of other benefits for their money. They do not, however, have a right to a good grade, no matter how hard they tried, unless they have mastered the course material.

As "products" that the College supplies to employers, who are also our customers, students should desire to be one



Under the leadership of Dr. Griffin the Engineering Fundamentals program is succeeding in...



of the best products in the marketplace. Virginia Tech engineers are widely known to be good engineers, and that's why companies keep coming back to campus to hire them. If the quality of that "product" declines, the companies will find another "vendor," perhaps up or down the road, where the product is better, and they will stop coming to Tech to recruit. Nobody wants that to happen.

The simple fact is that Virginia Tech engineers are highly recruited largely because of the rigor of their education. To prepare students for co-op and intern-

...producing the engineers of tomorrow.

ships, that rigor must begin in the freshman year, many times in stark contrast to high school.

If you think back to your Engineering Fundamentals classes, the rigor, the insistence on standard format, neatness, timeliness, and accuracy were probably the things you objected to most. However, those same characteristics are among the hallmarks of a good engineer. It is not because we enjoy marking papers down

for "picky" things like spelling, punctuation, and mathematical accuracy that we stress such things in EF courses. We know that attention to detail, firm foundation in the basics, and the ability to solve any problem thrown at you will possibly be the factors that make you superior to the engineer from down the road, and we are determined that you can and will be the best. As our customer, you should neither expect nor accept any less. **EF**

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ENGINEERS' FORUM

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NORRIS 329

BLACKSBURG, Nov. 6, 2000 -- The university board of visitors voted today to name the new engineering building in honor of the late Fred D. Durham, Class of 1921. Durham, who received his degree in civil engineering, co-founded the Dover Corporation, a Fortune 500 manufacturing company headquartered in New York City. "It is entirely fitting that this building will be named after an individual who achieved such success in the field of engineering," said William F. Stephenson, dean of the College of Engineering.

Durham credited Virginia Tech for much of his success, according to his daughter, Eleanor Durham Davenport. "His feeling was that Virginia Tech had helped him so much, he wanted to give young people their chance at a good education," she said.

Mrs. Davenport, along with her husband, William M. Davenport, and their children, Victoria A. Shivel and William Martin Davenport Jr., have pledged \$5 million to establish a scholarship endowment to support undergraduate and graduate engineering scholarships. "Scholarships not only empower students with financial



The building formerly known as The New Engineering Building.

Fund. "During his life, my father did not want any recognition although he helped out quite a few people," said Davenport. "I feel it is a wonderful tribute to his memory to let people know what he did."

Born in the last year of the 19th centu-

based on his incredibly clear recollection of being a student here shortly after the turn of the century. It was apparent that his time at Virginia Tech meant quite a lot to him."

After graduation, Durham went to

Scholarships not only empower students with financial resources, but more importantly with a sense of pride that their efforts and accomplishments have been recognized.

resources, but more importantly with a sense of pride that their efforts and accomplishments have been recognized," said Stephenson. "This scholarship, like those Fred Durham established, will have an impact on our students for years to come."

Durham's support of Virginia Tech spanned more than two decades and totaled more than \$1.3 million. He established the Fred D. Durham Endowed Chair in Engineering, the Fred D. Durham Endowed Scholarship fund, and the Benjamin F. Bock Endowed Scholarship

ry, Durham enrolled at Virginia Tech in 1917 but interrupted his studies after three years and traveled around the world on a tramp steamer. He returned to school and garnered a B.S. degree in civil engineering in 1922.

President-emeritus Paul Torgersen noted that Durham's memories of his years at Virginia Tech stayed with him throughout his life. "I had the great privilege of visiting Fred Durham a number of times after he retired," said Torgersen. "I learned so much about the history of the university

work for the C. Lee Cook Manufacturing Company in Louisville. He later bought the company and became president. In 1955 Durham and a partner formed the Dover Corporation and built it into one of the nation's leading manufacturers of automotive products.

Durham Hall is the university's newest engineering building and houses the departments of civil, electrical, industrial and systems, and mechanical engineering. The building was first opened for classes in the spring semester of 1998. **EF**

Breaking Down Internet Barriers

BLACKSBURG- Congressman Rick Boucher (VA-9) has announced that the National Science Foundation (NSF) has awarded \$2.55 million to Virginia Tech for a novel education and research program aimed at making the Internet a more accessible global communications infrastructure.

"This grant will continue to help position Virginia Tech and Southwest Virginia as a national leader in advanced communications systems," said Congressman Boucher. "The research that will be conducted here at Virginia Tech will be an important milestone in helping to realize the promise of the Internet in rural areas of the country. This work holds the promise to significantly improve our ability to attract more high-tech employers to the region."

The university will provide matching funds for the Integrated Research and Education in Advanced Networking (IREN) program, which will sponsor fellowships for engineering, computer science, economics, and business graduate students on the Blacksburg campus and at the university's Alexandria Research Institute (ARI). The program also will create a novel educational process that will enable graduates to fully contribute to the revolution in networking.

Working with technology developers and users from industry and government, the IREN fellows will conduct multidisciplinary research on several advanced networking topics, including broadband wireless access, mobile access to Internet resources, Internet appliances, network security, quality of service, and management of large-scale networks.

"These topics represent key barriers to making the Internet the common, ubiquitous, and global communications infrastructure of the future. The goal of the advanced networking program is to help make the Internet accessible in almost any location for almost any application," said Scott Midkiff, Virginia Tech professor of electrical and computer engineering

(ECpE) and director of the new program. "The problems of Internet access that the program will tackle are important to both industry and government," Midkiff said. "These also are areas in which Virginia Tech has research expertise as well as strong faculty and student interest."

As many as 19 students will participate in the IREN program and five or six Ph.D. graduates are expected per year. About one-third of the IREN fellows will conduct research and take courses at the ARI, Midkiff noted. The ARI also will provide connections to industry and international partners for the program. In addition to research, students will learn to work in multidisciplinary, distributed teams. "They also will gain an understanding of business and global issues and improve their ability to communicate effectively," Midkiff said.

IREN fellows at ARI and in Blacksburg will be encouraged to complete at least one internship with an industry or government partner. Current industry partners include 3Com, IBM, Litton Network Access Systems, RF Micro Devices, and United Technologies Research Center. Industry and government partners also will serve as advisers, provide seminars and workshops, sponsor students and research, and collaborate on research.

Virginia Tech is matching the NSF funding primarily through faculty support, graduate assistantships, and laboratory equipment. Other faculty participants are Charles Bostian, Luiz DaSilva, Nat Davis,

and Bill Tranter of ECpE; Marc Abrams, Ing-Ray Chen, and Srinidhi Varadarajan of computer science; Pat Koelling of industrial and systems engineering; George Morgan of finance; Sheryl Ball of economics; and Joe Sirgy of marketing. Also assisting with the program are Pam Kurstedt, director for the College of Engineering at the Northern Virginia Center; Beville Watford, associate dean of engineering for academic programs; and Michael Alley of ECpE.

Another component of the IREN program will be the university's Local Multipoint Distribution Service (LMDS) Initiative, the wireless broadband access that the Virginia Tech Foundation acquired from the FCC in 1998. The licensed area covers about 30 percent of the Commonwealth, and IREN fellows will participate in the design, deployment, use, and evaluation of novel LMDS-based broadband wireless networks.

"NSF's support of our IREN program is evidence that Virginia Tech is a leader in the state and a strong competitor on the national level in networking technology and research," Midkiff said. NSF is providing funding through its Integrative Graduate Education and Research Training (IGERT) in Advanced Networking program, initiated in 1997 to help educate Ph.D. scientists and engineers with interdisciplinary skills needed for the jobs of the future. The agency awarded grants to 19 universities in 2000. This is the first IGERT grant presented to Virginia Tech. EF

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Checklist for surviving Blacksburg winter weather: Heavy coat to keep out the cold, check! Gloves and hat to stop the biting wind, check! Nice tan to help forget the cold temperatures and biting wind... nice tan? In Blacksburg? Indoor tanning brings the best of the little latitudes to this southwestern corner of Virginia and helps students look their best

uct is maintained. How does it all work? To understand this lets take a step back.

The sun emits three types of ultraviolet radiation, UVA, UVB and UVC. UVC rays have the shortest wavelengths and pose a significant threat to all living organisms. The ozone layer blocks these harmful UVC rays, thereby protecting us from the suns most

tions, such as tuberculosis. With the use of the sun as an alternative medical treatment a tan became a visible sign of good health. Possessing a vibrant tan has also been revered in the US where no vacation is complete without a little sunbathing.

What exactly is a tan? A tan is a basic protection mechanism by the body when exposed to ultraviolet

Sun tanning began in Europe as part of "heliotherapy" in the early 1900's. Sun exposure was believed to improve various medical conditions, such as tuberculosis.

under all those layers of clothing. How does one get a vibrant tan during the winter months? There is a lot more to tanning indoors than just lying under some lamps and avoiding orange skin. Engineering the perfect tan takes the precision and scheduling of a construction project. In building construction, the foundation is completed, the building is constructed, and the finish product is maintained. When engineering a tan, the foundation is completed, the maximum tan is constructed and the finished prod-

uct is maintained. How does it all work? To understand this lets take a step back. The sun emits three types of ultraviolet radiation, UVA, UVB and UVC. UVC rays have the shortest wavelengths and pose a significant threat to all living organisms. The ozone layer blocks these harmful UVC rays, thereby protecting us from the suns most dangerous ultraviolet radiation. UVB rays have a "medium" wavelength and are responsible for beginning the tanning process, but they also cause sunburns. UVA rays, considered the "safest" ultraviolet radiation, have the longest wavelength and penetrate deep into the skin to the dermis. UVA rays aid in the development of a deeper, long lasting tan.

Sun tanning began in Europe as a part of "heliotherapy" in the early 1900's. Sun exposure was believed to improve various medical condi-

tions, such as tuberculosis. With the use of the sun as an alternative medical treatment a tan became a visible sign of good health. Possessing a vibrant tan has also been revered in the US where no vacation is complete without a little sunbathing. What exactly is a tan? A tan is a basic protection mechanism by the body when exposed to ultraviolet radiation. Darkening of the skin provides a barrier that can deflect small amounts of UV rays, preventing further skin damage in the form of sunburn. When the outer layer of the skin is exposed to sunlight pigment in the skin called melanin is oxidized. This oxidized melanin is responsible for the darkened appearance of the skin that we call a tan. When UVA rays penetrate the epidermis, melanocytes (pigment producing skin cells) create more melanin, which in turn maximizes a tan.

Tanning level and ability differs by skin type. How much a person can tan is controlled by genetics and cultural heritage. The more melanin producing cells an individual has, the greater their ability to achieve a tan. Tanning is not as simple as good genes and a little ultraviolet radiation though. There are numerous techniques to apply and schedules to follow in order to achieve a "bronzed" appearance. As these techniques were mostly developed for indoor tanning, they will be discussed later in the article.

At the onset of the sunbathing craze, the only way to tan was outside. Generations of people spent their summers at the pool or beach with a bathing suit and a bottle of tanning oil. However, we now know that tanning outside may not be the best way to maximize a tan.

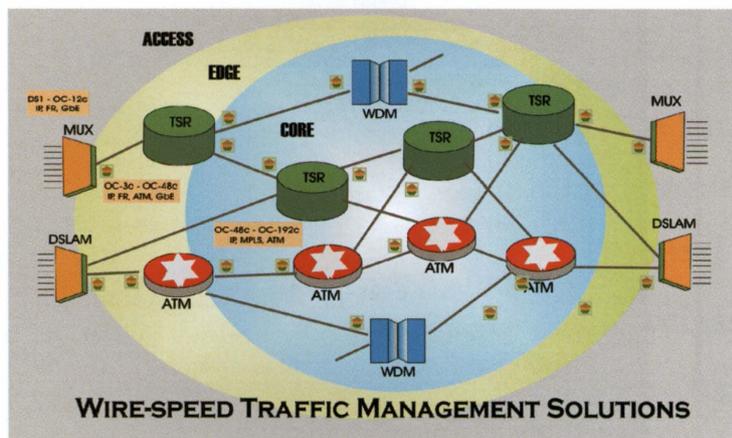
Sun tanning outdoors provides exposure to the long wavelength, deep tanning UVA rays as well as the sunburning UVB rays. Repeated sunburns, caused by UVB rays, have been linked to numerous ailments including blistering, skin discoloration and skin cancer. Tanning outdoors requires long periods of expose to maximize the skin's absorption of UVA rays. With the depletion of the ozone layer, more harmful ultraviolet radiation reaches the earth's surface. Long exposure to more UVB rays is a precarious situation facing outdoor sunbathers. Indoors

With all the drawbacks of outdoor tanning, the German doctor Freiderich Wolff searched for a better way to sunbathe. Dr. Wolff found that by exposing skin to ultraviolet radiation produced by special

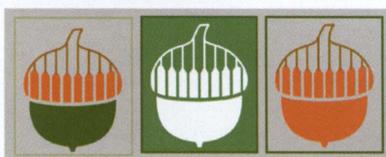
lamps, people could maintain a "healthy" tan throughout the long European winters. The clamshell-like beds designed by Dr. Wolff made their way to the US in the early 80's and their popularity continues today.

The premise behind indoor tanning is that an individual is getting all the rays they want (UVA), and little to none of the sunburn/skin damage caused by UVB rays. The lamps used in tanning salons have been refined to the point that they produce only a fraction of UVB rays as compared to their UVA counterparts. This way a patron can achieve a deep tan without risking the dangers of outdoor tanning.

Another supposed advantage of indoor tanning is that exposure is controlled. While sunbathing outdoors, there is no restrictions on the



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amount of exposure so there is always a risk of sunburn. With indoor tanning, the FDA regulates all sun lamps and equipment prior to use. The FDA mandates that all beds have functional timers and safety switches to control exposure. Further requirements include the use of safety goggles during tanning. Without the goggles, the UV radiation poses a serious threat to long term vision.

There are other dangers to indoor tanning not readily mentioned by salon owners. Critics, doctors and regulatory groups warn against the use of tanning beds. Doctors point to research that shows "harmless" UVA rays may weaken the dermis causing weak, sagging skin and premature wrinkling. It was once thought that skin

cancer was caused by overexposure to the sun in the form of sunburn. Recent information suggests that prolonged exposure to ultraviolet radiation, even if it does not cause burning, significantly increased the potential for cancer. Ultraviolet radiation exposure has also been linked to numerous problems with the immune system, and bad reactions with certain medications.

As with most activities there is just as much information espousing the benefits of indoor tanning as their is information warning against it. Research states that tanning can improve mood, especially during winter months. Confidence in appearance from tanning can also boost an individuals mood the study concludes. Another argument for tanning is that the body

produces vitamin D from exposure to UV rays. However, there is no conclusive evidence that regular exposure to UV rays, such as walking outside, does not stimulate the body to produce enough vitamin D. Until there is conclusive evidence one way or the other, both critics and promoters will continue to argue the hazards and benefits of tanning.

Now that we know everything about tanning, how does an individual engineer the perfect tan? According to tanning salons in Blacksburg, the first key is building up the base tan. The base tan usually takes 10-15 regular tanning sessions of roughly 15 minutes each. The key to creating this base is to always wait at least 48 hours between sessions (only 4 times per

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week). Tanning everyday prevents the skin from repairing itself and can have significant long-term impacts (i.e. wrinkling and weak skin). After the base tan is achieved the salons recommend at least 2 tanning sessions a week to build and maintain the perfect tan. The salons also claim that using a tanning accelerator, a concoction of ingredients intended to enhance the body's natural tanning ability, will help an individual tan 50% faster and keep their tan 90% longer. So once the foundation is build it only takes about half an hour a week to maintain the perfect tan. Just try maintaining that summer tan outside in Blacksburg in mid-February! 

type according to skin type

I

always burns; never tans; sensitive

II

burns easily; tans minimally

III

burns moderately; tans gradually to light brown

IV

burns minimally; always tans well to moderately brown

V

rarely burns, tans profusely to dark

VI

never burns; deeply pigmented

THE 10 COMMANDMENTS FOR FRESHMAN ENGINEERS

Thou shalt not forget thy social security/student id number.

Love thy periodic table & derivative/integral tables.

Let not the residence hall food distress ye, for in time thou will grow used to it.

Thou shalt not procrastinate with your studying, lest ye be left cramming.

Thou shalt not envy a Liberal Arts student's workload.

Thou shalt seek the advice of upperclassmen in the engineering curriculum.

Conserve thy strength for the unavoidable all-nighters.

Honor thy professor who giveth thou thine grade.

Thou shalt become a weekend studier, for then ye will inherit the A's.

Forget ye not to recharge thine calculator, lest it faileth thee on

Physics exams and giveth thou strange and ungodly answers.

Have a Great Time With SWE!

by Amanda Hurst

Looking for an organization that allows you to have fun, gain contacts with large and small companies, help the community, and share experiences with fellow engineers? If you answered yes, then the Society of Women Engineers (SWE) is the organization for you. This year's SWE officers and members have planned the most fun and exciting activities ever!

The Society of Women Engineers kicked off the year with a great social to recruit new members. There was an excellent turnout and new member sign up. Everyone played SWE Bingo and learned interesting facts about one another. The winners received a SWE national conference binder. Afterwards, refreshments were served. This event was very successful, but we are always encouraging more engineers to join our society.

Earlier in the semester SWE went tubing on the New River. This was an awesome day. Everyone had fun tubing, which was followed by a cookout. We are planning additional social events such as this, and all help is appreciated when planning and organizing these activities. Our meetings involve planning of events as well as having information sessions, learning relaxation techniques, sponsoring helpful discussions/activities, and most important having fun! So far this year's SWE members have learned how to prepare for a job fair and also learned self-defense. Members of the Tae Kwon Do Club taught the self-defense seminar. SWE members paired up and were taught defense moves for many different attack positions. We learned what to do in situations from being grabbed from behind, pinned on the wall or floor, to being attacked from the front. This seminar

was very beneficial to all that attended. This meeting increased the awareness of the dangers in case of attack by someone no matter what their size or gender. It has also, increased confidence of the members' abilities to get out of these situations. These activities are just the beginning.

Up and coming semester events are already in motion. SWE committees are planning a Lego competition at a local elementary school, which will encourage girls to take interest in math, sciences, and engineering. We are also, planning our contribution to the Montgomery County Christmas Store. This is an annual event SWE attends to help needy families celebrate Christmas. Without the store they would not have a

Christmas in their homes. Other meeting activities for the semester include a Resume Workshop, Yoga, and Car Know How. The remainder of the semester will be fun and exciting!

Already in the works for Spring 2001, SWE is planning our annual Girl Scout Exploring Engineering Day and Discussion with High School Girls. Both events encourage girls of all ages to explore engineering as a future route of study.

At Girl Scout Day, SWE members gather and have young girl scouts experience various engineering fields through small activities. SWE usually host approximately 150 girls and parents. This is always an exciting event and we need all the support from engineering students as possible. Also, we are planning our annual Lunch and Discussion for High School Girls. At this event SWE encourages and supports girls that are considering majoring in an engineering discipline. Both events meet one of SWE's goals to encourage girls to become engineers.

New for the year is an Evening with the Industries. This is an annual dinner that allows SWE members and other engineering students to meet with corpo-



Jennifer informs new members about SWE

rate representatives in a more relaxed and social environment. SWE hopes that this event will be a valuable tool for learning more about career options and industry. So check out the web site for upcoming details and dates for the events when they are confirmed.



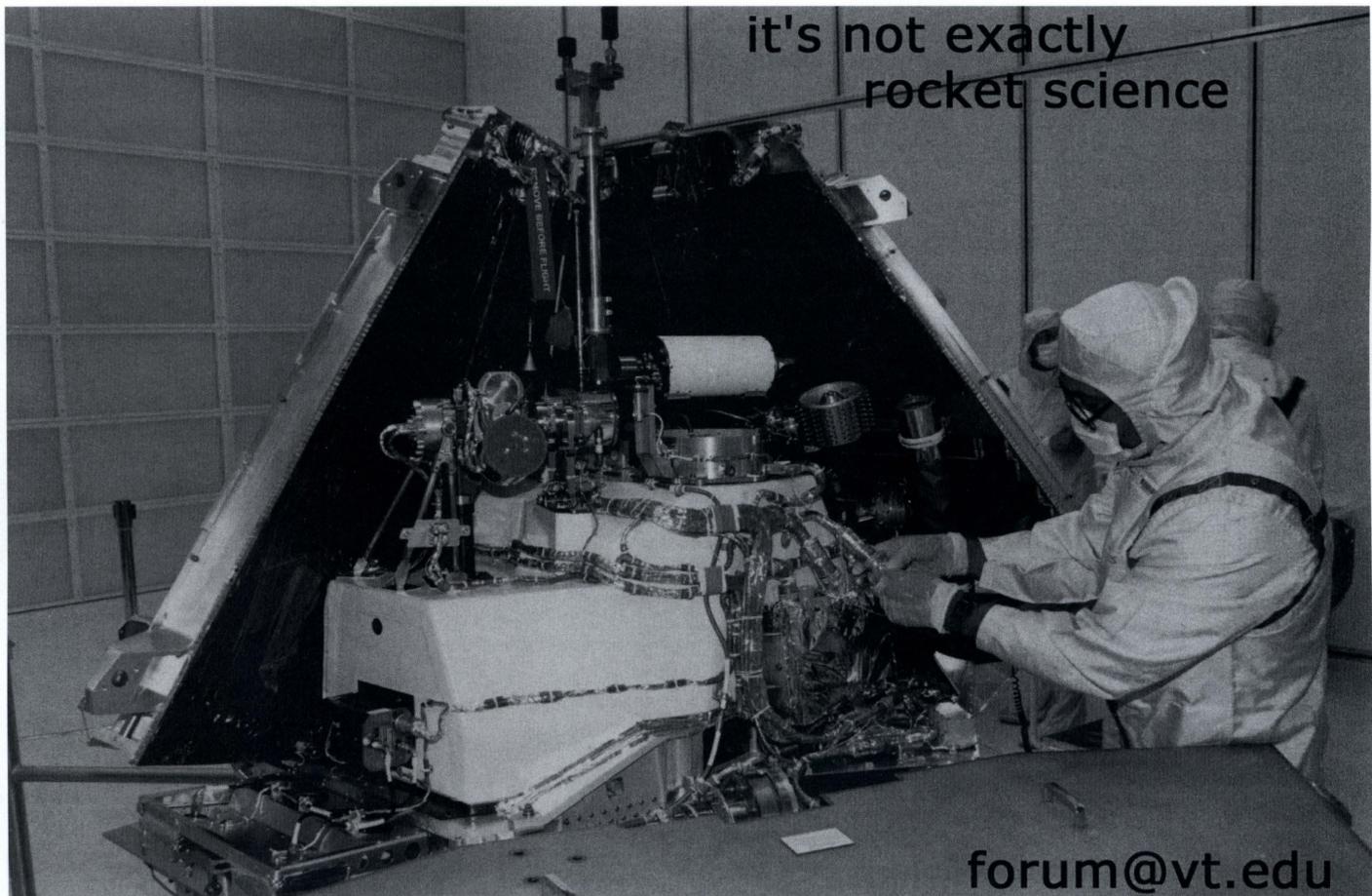
Katie and Kirsten learn a new defensive move.



SWE members have a good time trying out new defense moves.

SWE is a great organization. Our society can only run smoothly with the help of fellow engineering students like you. With SWE you can learn more about engineering, meet fellow students with similar interests, and help the local community. If

you think that the Society of Women Engineers sounds right for you, come out and join. Check out our website at <http://filebox.vt.edu/org/SWE>, to meet the officers and find out more information on SWE. Also, you can email us at swe@vt.edu, or stop by the office in Hancock 216A. Have a great semester, and we will see you at our next meeting!



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FROM THE
email bag
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The History of Teaching Math

Teaching Math in 1950:

A logger sells a truckload of lumber for \$100. His cost of production is $\frac{4}{5}$ of the price. What is his profit?

Teaching Math in 1960:

A logger sells a truckload of lumber for \$100. His cost of production is $\frac{4}{5}$ of the price, or \$80. What is his profit?

Teaching Math in 1970:

A logger exchanges a set "L" of lumber for a set "M" of money. The cardinality of set "M" is 100. Each element is worth one dollar. Make 100 dots representing the elements of the set "M". The set "C", the cost of production contains 20 fewer points than set "M". Represent the set "C" as a subset of set "M" and answer the following question: What is the cardinality of the set "P" of profits?

Teaching Math in 1980:

A logger sells a truckload of lumber for \$100. His cost of production is \$80 and his profit is \$20. Your assignment: Underline the number 20.

Teaching Math in 1990:

By cutting down beautiful forest trees, the logger makes \$20. What do you think of this way of making a living? Topic for class participation after answering the question? How did the forest birds and squirrels feel as the logger cut down the trees? There are no wrong answers.

Teaching Math in 1996:

By laying off 402 of its loggers, a company improves its stock price from \$80 to \$100. How much capital gain per share does the CEO make by exercising his stock options at \$80. Assume capital gains are no longer taxed, because this encourages investment.

Teaching Math in 1997:

A company outsources all of its loggers. They save on benefits and when demand for their product is down the logging work force can easily be cut back. The average logger employed by the company earned \$50,000, had 3 weeks vacation, received a nice retirement plan and medical insurance. The contracted logger charges \$50 an hour. Was outsourcing a good move?

Teaching Math in 1998:

A logging company exports its wood-finishing jobs to its Indonesian subsidiary and lays off the corresponding half of its US workers (the higher-paid half). It clear-cuts 95% of the forest, leaving the rest for the spotted owl, and lays off all its remaining US workers. It tells the workers that the spotted owl is responsible for the absence of felleable trees and lobbies Congress for exemption from the Endangered Species Act. Congress instead exempts the company from all federal regulation. What is the return on investment of the lobbying costs?

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INFORMATION

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tiffany's
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Best Before End
Production Code
See Storage Instructions
INGREDIENTS
Water, Dumplings (Wheat
Beef Suet, etc.)

The First Rule of Engineering is...

by Tom Catherwood

I wonder if Brad Pitt and Edward Norton could have cut it as engineers? How do you think they would have faired in differential equations, dynamics, or signals and systems? They probably wouldn't have made it past Engineering Fundamentals, but maybe they were on to something in their movie Fight Club. There were certain rules to Fight Club that were intended to keep it closed, controlled and powerful. In all, Fight Club had eight rules:

1. You don't talk about Fight Club.
2. You don't talk about Fight Club.
3. When someone says 'Stop' or goes limp, the fight is over.
4. Only two guys to a fight.
5. One fight at a time.
6. You fight without shirts or shoes.
7. The fights go on as long as they have to.
8. If this is your first night at fight club, you have to fight.

What if we were to take a few of these rules and replace the word "fight" with "engineering"? Would fight club have been successful if it was about engineers? Let's find out.

The first and second rules of engineering are most certainly "You don't talk about engineering." What is there to talk about anyway? It's all been decided long before you or I got here. There's one type of paper on which to complete assign-

ments. These assignments require special lettering. End of story. Why does the special paper require special lettering... Ahhhh, you broke the first two rules of engineering! Why do engineering textbooks read like Latin translations? STOP! The first rule of engineering is you don't talk about engineering. Actually, as Dr. Griffin pointed out in his perspectives article "**Being the Best Isn't Always Easy**" (P.3) there is a reason for the picky details. One characteristic that defines successful engineers is their attention to detail. That said, there is still no explanation for the textbooks.

"The third rule of Engineering is when someone says 'Stop' or goes limp, Engineering is over." We've all heard people say "Stop". We've seen them call off the fight, "That's enough engineering for me thanks." Why are we still here? Have we won all our fights? There have been numerous times when it would have been easier to give up than continue in engineering. EF, physics, and more, all just members of the club trying to make us tap out. Is it impossible, hardly. With hard work, motivation, good time management and a little luck here and there engineering can be beaten.

"The seventh rule of Engineering is Engineers will go on as long as they have to." Remember the adage, "The end justifies the means." Becoming an engineer takes time. Time that could be spent relax-

ing, sleeping, eating, partying. Time that could be used in a hundred different ways all of which are better than drawing a free body diagram. That's the challenge of the fight. The ability to block out distractions, focus and keep pointed in the right direction will help you in your fight.

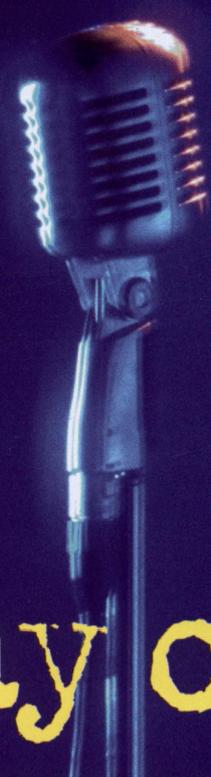
"The Eighth rule is if this is your first year in Engineering, you have to fight." Exam week is right around the corner. For many young engineers this is their first round with college finals. If this is your first year in engineering, you have to fight. Beginning classes are challenging. They are obstacles to overcome before branching off into an area of engineering that suits your interests. The obstacles are not easy. The first semester of college is rigorous, as are the other seven or eight or ten. To succeed you have to fight. This is your first chance to prove yourself in front of the club, so come out throwing punches.

Brad and Edward do deserve some credit. They may not now how to program in VBA, or how to close a traverse, but their rules are applicable to engineering. With exams in the upcoming week, the lines between fighting and engineering become easily blurred. The fight can be won, the trick not giving up. The fight may last four years, or five years or more. Don't say "Stop." At the end when you're still standing, you will be an engineer. Just follow the fifth rule of Fight Club and take it "One fight at a time."

Tom Catherwood
Tom Catherwood

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