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ENGR 101, Introduction To Engineering, Bookstore Packet

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Important Information
for Santa Barbara City College Students
Majoring in Engineering

Who: * Santa Barbara City College Students Majoring in Engineering → YOU!

What: * Planning your personal schedule.
  * See a counselor – Maria Morales is one counselor who is very interested in helping engineering students (the others in the “Engineering Cluster” are: Laura Castro, Wendy Peters, Sergio Perez & Shari Tucker).
  * Visit the Transfer Center.
  * See Engineering Professor Nick Arnold to get up-to-date engineering program information.
  * Go to www.ASSIST.org

When: * As Soon As Possible (ASAP)!
  * Especially while you can still add classes and change your schedule.

Where: * Nick Arnold is in room ECC-10A (East Campus Classrooms) during his office hours, or he can be reached at extension 4253, or email at arnold@sbcc.edu.
  * Maria Morales is in the counseling center, SS (Student Services) Bldg.
  * The Transfer Center is also in the SS (Student Services) Bldg.
  * www.ASSIST.org is on the internet.

Why: * Taking the wrong classes, or taking classes in the wrong order can add years to the time it takes you to complete your degree, and you could lose financial aid.
  * You may not be accepted for transfer without the proper courses, and some courses need to be taken before you apply for transfer.
  * Learn about other strategies to ensure successful transfer.

How: * Go to www.ASSIST.org
  * Almost all engineering students should NOT do IGETC (Intersegmental General Education Transfer Curriculum).
  * Talk to professors.
  * Talk to counselors.
  * Update and verify your IEP (Individual Education Plan) every semester.
  * Visit the Transfer Center.
  * Check the catalog and web pages of the schools you plan to apply to for transfer.
  * Talk to students who have transferred.
  * YOU are the one who is ultimately responsible for taking the right courses in the right sequence and preparing yourself for transfer.

IGETC
SECTION 1: ENGINEERING PROFESSION
Purdue University Engineering Starting Salary Statistics

2000-2001 Average Beginning Salary Offers*


Compare the 2000-2001 beginning salaries to just a few years ago!

STARTING SALARIES - MAY 1997
PURDUE B.S. GRADUATES

The figure is based on data taken from University Placement Service Annual Report: July 1, 1995 - June 30, 1996, Purdue University Placement Service, 1996.

https://engineering.purdue.edu/FrE/ESCAPE/stats/stat_gifs/start_sals.html
TYPES OF ENGINEERING

Aerospace engineers are involved with the design and development of high speed vehicles such as aircraft, missiles, and spacecraft. In recent years this has included ocean vessels, race boats, and high-speed land vehicles as well. Since these vehicles operate in extreme environmental conditions, complex engineering systems are required which include fluid mechanics, thermodynamics, structural mechanics, and control systems theory. Often the aerospace engineer is asked to solve problems that require imagination and creative thinking skills.

Agricultural engineers are becoming important as agriculture advances beyond family farms into large operations that use machinery instead of workers to perform many of the tasks such as feeding of animals on dairy, beef, swine (pig), and poultry (chicken) farms. Agricultural engineers are asked to improve such things as food product design, soil and water, electric processing, power and machinery, hydraulic systems, the effect of noise and vibration on farm equipment, and farm environments.

Chemical engineers design and develop changes in materials through chemical processes such as the changing of natural fuels into automobile gas or plastic; trees and wood into fibers or paper; and raw chemicals into medicines and drugs. They are also hired for pollution prevention or waste disposal.

Civil engineers design and supervise the construction of freeways, highways, major buildings, dams, bridges, water aqueducts, pipelines, airports, water treatment plants, sewage treatment plants, flood control projects, and any other structures that are needed.

Computer engineers are the experts who design hardware (or actual computer equipment). To do this, they need to know programming (how to make computers do what you want them to do), operating systems (how computers think), computer architecture (how they are built), database systems, telecommunications, and software engineering (inventing new software or computer programs).

Electrical & electronics engineers are hired by many different types of employers in business as well as by government and public utility (power) companies to discover and design new uses for electrical power and electronic gadgets such as robotic systems, telecommunications, multimedia computing, televisions, and more.

Environmental engineers are concerned with the interrelation of people, materials, and processes in a changing environment. This is a broad field which includes control of air and water pollution, industrial hygiene (factory cleanliness and waste), noise control, solid waste, and hazardous (dangerous) waste management.

Industrial and manufacturing engineers are concerned with the best ways to use people, materials, and equipment in both production companies and service businesses. Sometimes, these engineers are called “time and motion” engineers who watch workers to see if a task can be done in a better way, in a shorter time, and with less motion (or work). They may design robots or other mechanical equipment to do part of the workers’ tasks.

Mechanical engineers are general-type engineers who must know about many fields such as mechanics, thermal (temperature) science, machinery and instruments, energy, control systems, and more. They are hired in business, government, education, and research companies to design, test, produce, operate, maintain, market, sell, manage, and educate others about mechanical products and gadgets. Mechanical engineers are also involved with designing ways to protect our environment.
ENGINEERING MAJORS

California State University, Long Beach
Chemical Engineering
Civil Engineering
Computer Science Engineering
Electrical Engineering
Mechanical Engineering
Engineering (Materials & Ocean)

California State University, Los Angeles
Civil Engineering
Electrical & Computer Engineering
Mechanical Engineering

California State University, Northridge
Civil & Industrial Engineering
Electrical & Computer Engineering
Mechanical Engineering

California State University, Sacramento
Biomedical Engineering
Civil Engineering
Computer Engineering
Electrical & Electronics Engineering
Mechanical Engineering
Mechanical Engineering Technology

California State University, San Francisco
Civil Engineering
Electrical Engineering
Mechanical Engineering

San Diego State University
Aerospace Engineering
Civil Engineering
Electrical Engineering
Mechanical Engineering

University of California, Berkeley
Civil Engineering
Electrical Engineering & Computer Science
Industrial Engineering & Operations
Material Science & Mineral Engineering
Naval Architecture & Offshore
Nuclear Engineering
Applied Science & Technology
Bioengineering

Biophysics
Earth Resources Engineering
Engineering Science
Manufacturing Engineering

University of California, Davis
Applied Science
Biological & Agricultural Engineering
Chemical & Materials Science Engineering
Civil & Environmental Engineering
Computer Science
Electrical & Computer Engineering
Mechanical & Aeronautical Engineering

University of California, Irvine
Chemical & Biochemical Engineering
Civil & Environmental Engineering
Environmental Engineering
Materials Science
Mechanical & Aerospace Engineering

University of California, Los Angeles
Aerospace Engineering
Chemical Engineering
Civil Engineering
Computer Science
Computer Science & Engineering
Electrical Engineering
Bioengineering Specialization
Mechanical Engineering

University of California, Riverside
Chemical Engineering
Biochemistry Option
Chemistry Option
Computer Science
Electrical Engineering
Environmental Engineering
Mechanical Engineering

University of California, Santa Barbara
Chemical Engineering
Computer Science
Electrical Engineering
Mechanical Engineering

The above information is presented as a guide only and may change from term to term. Please consult the college catalog or call the college's Admission Office for types of engineering majors offered. College News may be photocopied by the school, district, or organization subscribing to California Work World newsletter to distribute to staff within that school, district, or organization for informational purposes and to share with students.
The primary purpose of the following titles and definitions is to improve understanding between the student and the job interviewer regarding job interests. It is hoped that it will aid the student in interpreting the companies' requirements as listed in the weekly bulletins.

It must be remembered, however, that "Production Engineering" for example, has an entirely different meaning in the petroleum industry than it does in manufacturing. These definitions have been gathered from numerous sources and are not intended to relate to any one industry.

**Plant Engineering**

Planning, developing, installing, and maintaining the plant facilities and services required by the company are the responsibilities of the Plant Engineer. Duties could be layout of machines and equipment, layout of new or existing plants, provide heavier electrical systems, expand or remodel production lines, increase compressed air services, provide air conditioning and humidity control, install larger boilers and all of the other engineered services required in a modern industrial plant.

**Quality Control Engineering**

The Quality Control Engineer is responsible for the quality and reliability of the product. The Engineer controls and evaluates all manufacturing materials and operations which affect product quality and reliability. Your specific duties are to:

(a) Develop and perform incoming, inprocess, and final inspection procedures.

(b) Provide facilities for calibrating instruments, equipment, and tooling.

(c) Develop methods of measurement and sampling size from which to provide design engineering with statistical guidance.

(d) Develop quality assurance procedures that ensure that maintenance of reliability is inherent in the design.

(e) Perform quality acceptance evaluations.

(f) Evaluate module and component reliability needs and status.

**Process Engineering**

Responsible for designing new plants, making changes in existing plants, and engineering new processes. Maybe trouble shooting an existing process and locating its bottlenecks, in order to increase production capacity, to improve product quality, and to lower operating costs. Or, you may be assigned to develop a new process, adapting it to industrial equipment in a pilot plant.

**Development Engineering**

A Development Engineer initiates design changes in existing products; modifies existing products; prepares engineering specifications to keep production within cost limits.

**Production Engineering**

It is the function of the Production Engineer to create maximum value from given inputs. Your assignments include increasing production capacity, debottlenecking, and improving overall efficiency. You are involved in reworking existing units or designing new units to produce a new product, installing and starting up new equipment, and making improvements in procedures of materials handling and quality control.

**Product Engineering**

Product Engineers design for production and solve problems of manufacturing operations, engineering changes, costs, and servicing. Responsibility continues throughout the manufacturing of a product and includes the handling of engineering changes.

**Product Test Engineering**

Product Test Engineers initiate the analysis of new product capabilities. Engineers in this area follow a product from early design concepts through the first manufactured units, devising test procedures in advance, and originating methods that will predict product capabilities accurately.
Materials Engineering

Advise Design and Development Engineers on the availability of materials. Evaluate materials and process developments for product line and design groups.

Systems Engineering

A Systems Engineer interprets, evaluates and complies with customer specifications. You coordinate efforts of the various engineering disciplines (electrical, mechanical, maintainability, reliability); also procurement, production, and manufacturing engineering efforts. Customer and subcontractor engineering liaison is also your responsibility. You schedule engineering personnel and end item design and testing to assure that the product is properly designed, tested and delivered to the customer on time. Specifications for subcontract items are generated by the Systems Engineer, who furnishes other engineering data to procurement to aid in the purchase of these items. In summary, the Systems Engineer obtains, analyzes and evaluates technical data to fulfill requirements of both the customer and the company's own engineering and production facilities.

Application Engineering

An Application Engineer provides specialized support for the salespeople. The Application Engineer gathers information, analyzes and prices inquiries from the field, devises modifications, and even special designs to meet the customer's needs. Typical responsibilities are keeping abreast of trends in product design and competitive conditions. Application Engineers become "authorities" on various types of products and their industrial and commercial applications. Application Engineers are the counselors to the field sales force and often make "technical" calls on customers. As an example: in electrical engineering the responsibility of the Application Engineer includes the design and development of electrical control circuits, and the specification of suitable components of maximum safety and reliability.

Value Engineering

Value Engineers have staff responsibility for reinforcing operating divisions, with the objective of improving product quality while reducing cost. The engineer's duties will involve planning, execution and evaluation of cost improvements projects covering all phases from product inception through design, development, testing, equipment design, tooling and production.

Production Control Engineering

The Production Control Engineer is responsible for designing new control systems, the installation of these systems and the improvement of scheduling systems which coordinate production efforts.

Project Engineering

The Project Engineer designs equipment, supervises its installation and handles initial operation. You develop new processes and equipment to reduce cost and improve quality, equipment and methods to promote use and sale and to provide technical assistance to plants and customers as requested.

Manufacturing Engineering

Manufacturing Engineers develop new standards, study manufacturing processes for methods of improvement, prepare cost estimates for new product proposals and develop new concepts for automating machinery and equipment. Closely related to Production Engineering.

Manufacturing Methods Engineering

The Manufacturing Methods Engineer determines the necessary equipment, tools and instructions for production of equipment in accordance with drawing and specifications from Design Engineering. Your responsibility extends:
(a) from the time a product has been designed and released for production
(b) through the design, set-up, and initial operation of the production line
(c) until the units are complete and ready for testing, and
(d) the operating product line is turned over to Line Supervision.
Systems Design & Development

Engineering

Systems Design and Development Engineers help to create new computer systems with development engineering, product engineering and programming teams working together to plan and develop an entire system, construct a working model, test it and help put it into production.

Circuit Design (Data Processing)

Design high-speed linear and switching circuits for use in central processor and input-output equipment. Develop advanced memory techniques including thin films, large-scale partial switching, linear-select core memories and coincident-current core memories. Develop microminiaturization techniques. Develop power systems for power supply design, cable design, start-up switches and interlocks.

Electro-Mechanical Engineering
(Data Processing)

Electro-Mechanical Engineers design mechanical components for input-output equipment, including high-speed mechanisms operating in milliseconds, repeatable in microseconds and with operating life in the hundreds of millions of cycles. This equipment performs the functions of printing, feeding, indexing, selecting, sensing and punching. Analyze performance and reliability requirements while stressing simplicity, serviceability and cost. Develop techniques and equipment to test and evaluate prototype models. Evaluate developments in metallurgy, kinematics, fluid dynamics, physics, magnetics and optics affecting the state-of-the-art of electronic data processing mechanical components. Determine the optimum method for packaging circuitry by evaluating materials, component cooling, and vibration and structural considerations.

Systems Analysts

Systems Analysts prepare plans for the application of automated data processing equipment to the solution of company data recording, reporting and operational and administrative problems, and follows development of the plans to satisfactory application.

Programmer

A Programmer develops and maintains advanced programming systems which enhance and extend the usefulness of computer systems. They analyze software and evaluate customer's programming requirements. Provide liaison between marketing and engineering teams.

Systems Engineering (Data Processing)

A Systems Engineer analyzes the requirements of science, industry and government in all areas of data processing, including communications, information storage and retrieval, random access, command and control, process control and real-time systems. Evaluate alternative systems to meet these requirements in both hardware and software. Design tests and diagnostic procedures to verify performance of prototype equipment according to specifications.

Reliability Engineering

Conduct component and system reliability studies in order to determine product effectiveness. Analyze test results and make recommendations for changes to insure compliance with customer specifications.

Design Engineering

The Design Engineer prepares plans and specifications for new products, or redesigns existing products to make improvements. You select materials and components and may recommend manufacturing processes. Design Engineers may also include the fabrication and testing of design concepts and models. Specifications, product cost and engineering objectives must always be kept in mind.
Development Engineering

Development Engineers are responsible for developing new products and finding new uses for established products to meet the needs of industry or of the individual consumer. They concentrate on problems such as planning, designing, and testing products to match performance requirements. They seek to effect product improvements for increased performance efficiency, higher quality and lower manufacturing costs.

Production Supervision

The Production Supervisor is responsible for producing a product in desired quantity and quality and for the safe performance of the personnel and equipment in the operating units assigned to you. Responsible for:
(a) Instructing others in proper operating procedures, then following up to assure compliance.
(b) Planning production and maintenance schedules.
(c) Assisting in resolving labor problems.
(d) Initiating process-improvement programs to reduce costs.

Research

Obtain new scientific knowledge of physical and human phenomena. Applied research would be doing much the same thing in areas impinging upon technologies of interest to the company. Other aspects of research might include:
(a) Investigate new fields and discover new products.
(b) Provide new uses for products.
(c) Improve existing products and processes.

Sales Engineering

The Sales Engineer acts as a liaison between sales and engineering and is responsible for customer contact and technical specification analysis. This includes preparing quotations and initiating and recommending engineering design changes. You may also advise on application problems, handle correspondence on product quality, toxicity, and visit customers with sales people on serious problems and prepare evaluation reports on experimental products with key accounts.

Field Service Engineering

The Field Service Engineer usually is in close contact with the customer. These duties include supervising installation and instructing customer personnel in the operation and maintenance of the product.

Technical Services

Provide maintenance and repair of consumer, commercial and industrial products and systems at service centers and at customer sites.

Facilities Control Engineering

The Facilities Control Engineer has primary responsibility for the planning and incorporation of new equipment and facilities, the replacement of worn or obsolete facilities, and the maintenance of equipment. You prepare cost-reduction and quality improvement studies. You also perform economic analysis studies -- comparing models of equipment or alternate methods of operation. A Facilities Control Engineer is typically required to plan new equipment or facilities to increase existing production or to produce a new product.
Creative Destruction

Crashing cars—lots of them—is how Volvo safety engineer Daniel Hedqvist earns his keep.

BY JOHN BLAU
CONTRIBUTING EDITOR

D
aniel Hedqvist is waiting for the day when he can crash a US $150 000 Aston Martin. He's already totaled a couple of Jaguars and more Volvos than he can remember. Running cars into steel barriers or other cars or the sides of mountains is his job. Hedqvist is a crash test engineer at the Volvo Safety Center in Göteborg, Sweden.

These days the Swede is also rigging up plenty of Fords for crash tests. Ford owns the prestigious Volvo, Jaguar, and Aston Martin car companies, and has made Sweden its center of excellence for vehicle safety testing. There's a good reason why the second-largest U.S. car maker has ceded this area of expertise to a non-U.S. supplier: few auto companies have won as many awards for car safety as Volvo.

Over the decades, Volvo's R&D team has churned out a steady stream of innovations, from the three-point front-seat safety belt to the rearward-facing child seat to the roll stability control system that helps prevent cars from flipping. Many of these safety milestones have prompted industry standards. And almost all are the result of numerous, rigorous crash tests.

Every working day, Hedqvist and his colleagues equip at least one car, sometimes fresh off the assembly line, to race down a specially built track and collide with a barrier or another car. The full-vehicle crash is the last in a series of rigorous tests. "It costs money, so you want to make sure you do everything right," he says. "Our work is not stress free."

Reving up

The state-of-the-art lab where Hedqvist works has virtually nothing in common with the small family farm in northern Sweden where he grew up, except, perhaps, for vehicles. "Being on the farm, I was around a lot of tractors, trucks, and other machines and was always fascinated by vehicles," Hedqvist says, the slightest Swedish accent gracing his near-perfect English. "I could drive a moped before I learned how to ride a bike."

Hedqvist doesn't recall any traumatic event on the farm or later at Luleå Technical University that prompted him to pursue a career in crash test engineering. If anything, his choice of occupation was coincidental. After graduating from the university in 1993, he was hired by a local automotive components supplier. "We did crash tests on a small scale," he says. "I really became interested in the tests, both in preparing the cars for crashes and later in analyzing the data. I could use both my practical and theoretical skills."

In the spring of 2000, Hedqvist heard that Volvo was opening a new crash lab in Göteborg and saw an opportunity to take his growing interest even further. He joined Volvo in September of that year. Although his undergraduate degree had been in mechanical engineering, he soon found himself immersed in electrical, computer, and systems engineering.

Crash anatomy

Safety testing at Volvo usually starts with virtual crashes. Using an NEC SX-4 supercomputer, engineers can simulate collisions and study their effects on as many as 300,000 pieces of a car. Such virtual tests typically occur early on in the design of a new vehicle, says Hedqvist.
Real tests follow, and this is where Volvo has established cutting-edge systems. Its component testing facility, for example, uses specially built rigs to test individual components, such as hoods, steering wheels, and airbags. Its one-of-a-kind physical crash simulator allows entire car bodies to be fitted to a high-gravity sled to test safety systems inside the cabin as well as crash effects on occupants. The simulator can recreate the deformation and tipping, or pitch, that a car undergoes in a real-life collision without actually destroying the car body, thus letting engineers conduct repeated tests from the front, rear, and side.

Results from the crash simulator are verified on complete vehicles in Volvo's showcase crash laboratory, which is considered the most advanced in the world. The lab is located at the end of the main automotive production facility on the outskirts of Göteborg. "The lab is a very sophisticated, flexible testing facility where we can create and control just about every possible traffic environment, from speed and angle to temperature and humidity," Hedqvist says.

**Precision collision**

One of the lab's unique features is its two intersecting test tracks: a 154-meter fixed track and an 80-meter movable one that can be turned as much as 90 degrees. Front and side collisions can thus be tested at virtually all angles. If the back door at the end of the movable track is opened, cars can be sent flying directly into the rocky hillside outside. For so-called barrier tests, a single car on the fixed track hurtles into an 850-ton block at the far end.

Positioning the 600-ton movable track is an engineering feat in itself. Pressurized air is pumped beneath the track, opening up a 0.1-mm gap between the concrete track and the 20 rubber air cushions on which the track rests. Six specially built trucks can then maneuver the track.

Lasers measure the car's position with millimeter precision. This information is transferred to the 1800-kW electric motor that hauls the car down the track, ensuring that it collides at exactly the right speed. A couple of meters before the point of impact, the car runs freely.

Hedqvist and his colleagues gather crash data through various means. Depending on the test, they may wire up to 150 transducers, or sensors, in the car and on the dummies. In tight areas, they use fiber-optic tubes with camera lenses mounted on the tips.

Data collected from the transducers is stored in the internal memory of the car's on-board amplifier. The amplifier can store 60 seconds of data, of which only about 0.6 second—the time immediately surrounding the crash—is used. After the crash, the data is downloaded by cable to the lab's servers for post-processing. Visual data is also captured using over 30 high-speed photo and video cameras, which are placed above, alongside, and beneath the impact site.

It's vital to test the electronic systems, especially as cars become increasingly reliant on on-board computers. "In a crash test, you verify that all the electronics work—that they engage and deploy the different safety systems," Hedqvist says. Following the crash, he reviews and checks the accuracy of the data gathered before forwarding it to the lab's crash test analysts, who do further evaluations. Based on those results, the analysts will set the parameters of the next test, and together the analysts and test engineers decide where the sensors and cameras are best positioned.

Beyond just the sheer drama of smashing vehicles and the technical aspects of engineering the tests, Hedqvist also appreciates the work's social benefits: "Being a part of increasing personal safety certainly makes you feel proud of what you do."

**View to a crash**

So renowned is the Volvo lab that other car makers increasingly turn to it to test their own vehicles. One day last spring, several visiting car executives drop by to see what the facility has to offer.

They sit in an observation deck several meters from where the two test tracks intersect. The floor just below the intersection is made of several layers of hardened glass, beneath which a 6-meter-deep pit houses lights and cameras. Hedqvist and his colleagues are stationed in a control center on the opposite side. Today's test replicates a common traffic accident in which one vehicle broadsides another. There's typically a big impact on the cars' chassis and particularly their occupants.

It feels a little like a Broadway show just before the curtain rises. Spotlights hanging from the 14.5-meter-high ceiling illuminate the tracks. Preparation for today's crash has taken a few hours, but the test itself will last only seconds, from the time the cars start to roll down the tracks until they meet. As the engineers run last-minute checks and clear the stage, there's an air of suspense and anticipation.

The countdown begins, rocket launch style. Then silence, as the cars begin to move. Most of the engineers abandon their computer monitors to watch the action. Within seconds, the "bullet" car reaches its top speed of 50 km/h before striking the side of the "target" car, which is moving at 25 km/h. There's the thud of impact, accompanied by the sound of glass cracking and steel bending. The two cars spin slightly before coming to a halt, remaining interlocked.

The engineers look at each other; good crash, they nod. The executives look at each other; they're impressed. Now the cleanup begins and preparation for the next test.

As Hedqvist walks back to the engineering room where the sensors, cameras, and other systems are stored, he almost bumps into what looks like...a moose.

Well, this is Sweden, Hedqvist points out, and unfortunately the animals have a habit of wandering into the paths of oncoming cars, particularly in the north. The one in the corridor is a new crash test dummy that his colleagues and some university students are working on.

"I'm certainly looking forward to that test," he muses. "But not as much as the test on the Aston Martin."

Jean Kumaqai, Editor
CODEBUSTERS

When a fired employee encrypts the sales database, who ya gonna call?  

“Hello? Hello? This is a private line.”

“Hello? Hello? This is a private line.”

“Hello? Hello? This is a private line.”

“I’ve got a code,” said the desperate voice on the telephone. “Can you break it?”

Andy Clark is used to getting panicky calls like this one. Clark is a director of Inforenz, a leading computer forensics investigation company based in Surrey, England, that helps companies and law enforcement agencies recover stubbornly encrypted data. He’s also something of a magnet for unusual cases that go beyond digging up proof of embezzlement or leaked trade secrets. “We’re at the bottom of the food chain,” Clark says. “When everyone else has run out of steam, they come to us.”

The stealthy caller on the phone was Mark Dawson, son of actress Diana Dors, the famous 1950s British blonde bombshell. Just before her death in 1984, Dors had given her son a written code containing the location of her £1 million fortune (approximately US $1.5 million); she said her third husband, Alan Lake, had the key. Before Dawson could contact Lake, however, Lake committed suicide—and the code remained a jumble of letters on a yellowing piece of paper. Clark told Dawson that Inforenz would take the case.

Clark, 49, grew up near Brighton, England, with the ideal background for a future forensics specialist. A teenage hacker “in the proper sense of the word,” he wrote self-modifying code to boost the performance of PDP 8 and 11 machines, the popular minicomputers sold by Digital Equipment Corp. “I understood machines in a machine-code environment,” Clark says. “I thought down to the bit and byte level.”

That kind of thinking is important in his current line of work. Computer forensics...
RESOURCES

Drexel University - E. Warren Colehower Endowed Chair in Information Networking and Telecommunications

The Electrical and Computer Engineering Department at Drexel University invites applications and nominations for the E. Warren Colehower Endowed Chair Professorship in Information Networking and Telecommunications. The Colehower Chair Professor will head the ECE Department’s Information Networking and Telecommunications Research Center. Candidates must be well-known researchers and recognized leaders in one or more of the growing areas of Information Networking and Telecommunications, including, but not limited to, computer networks and systems; mobile and wireless systems; optical communications; switching and routing. Candidates should be eminent professionals with a significant track record in academia and/or industry supervising major research operations and executing independent externally funded research projects.

The Colehower Chair Professor is expected to exercise strong leadership in creating, expanding, and nurturing research programs and centers, mentoring junior faculty, supervising graduate students, developing and coordinating major research proposals, generating and maintaining a large-scale research operation through external funding, and representing the university in its relations with major research funding agencies, industry and government.

Applications and nominations should include a resume and the names and addresses of three references. Please submit all materials to:

Dr. Nihat Bilgutay
Department Head
Electrical and Computer Engineering Department
Drexel University
3141 Chestnut Street
Philadelphia, PA 19104

Eligibility to work in the United States at the time of appointment is required. Drexel University is an equal opportunity and affirmative action employer.

The art of unearthing data and clues left in computers and networks, whether to recover lost information or find evidence of a crime. “When trying to extract information from a huge amount of noise, you need to sometimes bury yourself at the bit level,” he says. “It’s a high level of systems engineering, with low-level, nuts-and-bolts engineering.”

After completing his degree in electrical engineering at Brighton Polytechnic in 1980, Clark worked on navigation and communications systems for a company called Singer/Link in West Sussex, which made flight simulators for commercial and military aircraft. Then, one day in 1984, Clark saw a TV program that changed his life. It featured a new piece of hardware that protected financial data flowing between computers by encrypting it. Intrigued, he interviewed at the company, Open Computer Security, based in Brighton, and was hired to be its research and development director.

In his new job, he worked on small, self-contained cryptographic hardware, including early versions of smart cards for banks and financial institutions. And he found his calling. “I was intrigued by the process, the mathematics, and the implementation,” Clark recalls. “It was extremely applied...it was extraordinary.” Strong encryption and tamper-resistant technologies, he explains, were only just appearing in the commercial world, having previously been the sole domain of governments and militaries.

Clark spent seven years at Open Computer Security, leaving in 1991 to start his own software encryption company. Two years ago, after selling his company, he cofounded Inforenz, a company that breaks into the same kind of wares he once created. “A lot of our work is spent in trying to reverse-engineer cryptographic products to check and prove their integrity,” he says.

In a typical Inforenz case, a disgruntled employee has encrypted a substantial amount of a company’s data, rendering it unreadable. To recover the data, Clark and his team of six engineers examine an exact digital duplicate of the employee’s computer hard drive using a combination of third-party tools, as well as tools Inforenz has developed in-house. Clark declined to reveal technical details of Inforenz’s process. But the company’s secret weapon, he says, is a parallel computer platform called Deep Thought.

Deep Thought was purpose-built to crack codes. Because Inforenz deals with a variety of ciphers, Deep Thought was created with a general-purpose architecture; rather than relying on custom-made chips for specific ciphers, it was built from commercially available components and modules. As a result, it’s good for cracking a wide range of codes.

“If someone comes in with encrypted data,” Clark says, “we put it in Deep Thought and attempt different decryption techniques, such as intelligent password guessing.” If that doesn’t work, he says, “two people will sit down at it until their brains hurt.”

As computer crime grows, the forensics field needs at least a few more brains. Other leading computer forensics companies include Guidance Software in Pasadena, Calif., VeriCept in Denver, and Vontu in San Francisco. Richard Mogull, a research director for Gartner Inc., a research and advisory firm in Stamford, Conn., says that although the growth of the field hasn’t been quantified, “someone with digital forensics skills will be in demand.”

For engineers interested in breaking into the field, Clark, who is also head of the nonprofit International Association for CryptoLogic Research, based in Santa Barbara, Calif., suggests gaining experience in high-tech crime units within law enforcement agencies. Academic programs are emerging as well, such as a master’s of science in computer forensics at Cranfield University in England.

Sometimes, though, cracking the code is not high tech at all. After taking on the high-profile Diana Dors case, Inforenz determined that the information was encrypted with the Vigenere code, a 17th-century system—well known to cryptanalysts—that was developed by a French diplomat. Inforenz solved the puzzle, revealing a number of surnames and locations. Though the code has been cracked, the mystery lives on. The fortune has yet to be recovered.

TO PROBE FURTHER:
Inforenz offers a demonstration program that analyzes Vigenere codes, complete with a copy of the Dors cipher for you to test your cryptological skills. See its Web site at http://www.inforenz.com/dianadors/.
1 ➤ PERSONAL INFORMATION

Please PRINT your name as you wish it to appear on your membership card and all correspondence. Circle your last/surname as a key identifier for the IEEE database. Do not exceed 40 characters or spaces per line. USE ONLY English characters and abbreviate only if more than 40 characters and spaces per line.

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Postal Code Country

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City State/Province

Postal Code Country

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Please send all IEEE mail to: □ Address During Academic Year □ Family or Home Address. If not indicated, mail will be sent to Address During Academic Year.

Are you now or were you ever a member of the IEEE? □ Yes □ No. If yes, please provide, if known:

Membership Number

Grade Year Membership Expired

To better serve our members and to supplement member dues, the IEEE mailing list is released to other engineering and carefully selected organizations to provide you with information on technical products and services related to your profession. Please check box if you do not wish to have your name released to such organizations.

2 ➤ EDUCATIONAL INFORMATION

Print complete school/name information. No abbreviations please. This information is required to qualify for Student membership.

University

School or College (if applicable) Campus

Street Address

City State/Province

Country

Postal Code

Degree Title Expected Expected Graduation Date Month/Year

Program Major/Course of Study

Current Degree Program (check one)

Undergraduate: □ 2 or 3 Year □ 4 or 5 Year Graduate: □ Masters □ Ph.D.


Do you hold other degrees? □ YES (complete below) □ NO

3 ➤ ENDORSEMENT AND SIGNATURE OF APPLICANT

Please print the name and provide the signature and member number of your IEEE Student Branch Counselor. If there is no counselor at your school, please obtain the endorsing signature of a faculty member who is also an IEEE member (membership number is required).

IEEE Branch Counselor’s Name Counselor’s Member Number

I endorse this application for student membership in the IEEE and certify the degree information as given is correct and complete.

IEEE Branch Counselor’s Signature

School Code

I hereby make application for IEEE membership and agree to be governed by the IEEE Constitution, Bylaws, and Code of Ethics. I am taking at least 50% of a full-time academic program.

SIGNATURE

DATE

Application must be signed.
Who Can Join?
IEEE Student membership is open to undergraduate and graduate students who are enrolled in at least 50% of a normal, full-time course of study in electrical, electronics, computer engineering or computer sciences, or in an allied branch of engineering technology or the related arts and sciences.

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Your life changes daily, and it is a challenge to stay connected. Get a free IEEE Personal Email Alias to forward your email wherever you go – you can update your information online anytime and stay connected no matter where you are.
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2003 STUDENT MEMBERSHIP RATES
IEEE student dues are based on where you live and when you apply. Please check the appropriate box.
A subscription to IEEE Potentials magazine is included in US and Canadian membership dues. IEEE Potentials is available in other countries for $5 per year. Membership is based on the calendar year from January through December.
Prices are quoted in US dollars.

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Options for IEEE members
Potentials magazine (in US and Canada) .................................................................................. $5.00 □ $3.00 □
Proceedings of the IEEE (print □ or online □) .................................................................... $25.00 □ N/A
Proceedings of the IEEE (online) ............................................................................................ $30.00 □ N/A
Standards Association (IEEE-SA) ........................................................................................... $10.00 □ (full year only)
IEEE Women in Engineering (WIE) ......................................................................................... FREE □ (full year only)

*Society Information
As an IEEE Student member, you are encouraged to join any Societies in your areas of study and technical interest. Each Society membership includes a personal subscription to the core journal, newsletter, and oversea Society newsletter. Prices are quoted in US dollars.

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You may pay for membership by:
- American Express, Visa, MasterCard, Diners Club, Eurocard
- Check – Payable to the IEEE on a bank in the US or in acceptable local currency
- Money Orders – Payable to a bank in the USA in or acceptable local currency

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Please total the Membership dues from above and any Society dues from the side panel.

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| Society dues (□) | $ |
| IEEE Dues (□) | $ |
| IEEE-SA Dues (□) | $ |
| Canadian residents pay 7% GST or 13% HST | $ |
| Amount Paid | $ |

Payment to the Technical Societies of the IEEE may only be sent to your address.

Student-Get-A-Student Recruiters: For SG credit (issued Sept. 2003), please complete below.

STUDENT MEMBER RECRUITER NAME

IEEE RECRUITER STUDENT MEMBER # (required for SG credit)
# ASME Student Membership and Renewal Application

Instructions: Complete all applicable parts and enclose $25 USD dues payment with application. Fold the application and tape closed to mail. (Application will not be processed without payment.) Note: Exact birthdate (including year) and approximate date of graduation required for processing of application. For assistance in completing this application call/fax questions to 1-973-682-1167/1717 or call 1-800-THE-ASME.

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Under pending Federal laws, ASME must have my written permission in order to communicate with me via fax or email. I hereby give ASME and its business associates written permission to communicate with me via fax and/or email at the number and addresses shown herein.

### Race/Ethnic Identification:
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- [ ] American Indian/Alaskan Native
- [ ] Asian/Pacific Islander
- [ ] African American
- [ ] Hispanic
- [ ] Caucasian
- [ ] Other

I am a: ☐ 1st year/Freshman ☐ 2nd year/Sophomore ☐ 3rd year/Junior ☐ 4th year/Senior ☐ Graduate

I am currently seeking the following degree: (check one)
- ☐ BA
- ☐ BS
- ☐ MA
- ☐ ME
- ☐ MS
- ☐ PhD
- ☐ ScD
- ☐ Other (Describe) __________

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#### TECHNICAL DIVISIONS

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#### MEMBERSHIP OPTIONS

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<td>(You will be eligible for all membership benefits including subscriptions to Mechanical Engineering magazine and ASME News.)</td>
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<tr>
<td>☐ Free Limited Membership Option available during first year in college only. (You will be eligible for all membership benefits except subscriptions to Mechanical Engineering magazine and ASME News.)</td>
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<td>☐ International Dues Discount</td>
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### X

Signature of Applicant

I subscribe to the above record and when elected will be governed by the Constitution and By-Laws of the Society and its Code of Ethics as I continue as a member.

I further agree to promote the objectives of the Society where possible.

Date

ASME Student Section Advisor’s Signature (or Dept. Head or Dean)

School Code
Code of Ethics of Engineers

The Fundamental Principles

Engineers uphold and advance the integrity, honor and dignity of the engineering profession by:

I. using their knowledge and skill for the enhancement of human welfare;
II. being honest and impartial, and serving with fidelity the public, their employers and clients; and
III. striving to increase the competence and prestige of the engineering profession.

BOARD, PROFESSIONAL PRACTICE AND ETHICS

7/04 MS5503

The Fundamental Canons

1. Engineers shall hold paramount the safety, health and welfare of the public in the performance of their professional duties.
2. Engineers shall perform services only in the areas of their competence.
3. Engineers shall continue their professional development throughout their careers and shall provide opportunities for the professional and ethical development of those engineers under their supervision.
4. Engineers shall act in professional matters for each employer or client as faithful agents or trustees, and shall avoid conflicts of interest or the appearance of conflicts of interest.
5. Engineers shall build their professional reputation on the merit of their services and shall not compete unfairly with others.
6. Engineers shall associate only with reputable persons or organizations.
7. Engineers shall issue public statements only in an objective and truthful manner.
8. Engineers shall consider environmental impact in the performance of their professional duties.

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PO BOX 2900
WEST CALDWELL NJ 07007-9811

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GUINEA – BISSAU
HAITI
INDIA
INDONESIA
IVORY COAST
KENYA
KYRGYZSTAN
LAO PEOPLES DEM REPUB
LESOTHO
LIBERIA

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MALAWI
MAURITANIA
MOZAMBIQUE
MONGOLIA
MOLDAVIA
NEPAL
NIGER
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SIERRA LEONE
SOLomon ISLAND
SUDAN
TAJKISTAN
TANZANIA
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CAPE VERDE
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COLOMBIA
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CROATIA
CUBA
CZECH REPUBLIC
DJIBOUTI
DOMINICAN REPUBLIC
DOMINICA
EGYPT
EL SALVADOR
EQUADOR
ESTONIA
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MALDIVES
MEXICO
MOROCCO
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OMAN (MUSCAT, ARABIA)
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PERU
PHILIPPINES

POLAND
PEOPLES REP/CHINA
PANAMA
ROMANIA
RUSSIA
ST. LUCIA
SAMOA
ST VINCENT
SERBIA
SEYCHELLES
SLOVAKIA
SRI LANKA-CEYLON
SURINAME
SWAZILAND
SYRIA
THAILAND
TONGA
TRINIDAD AND TOBAGO
TURKMENSTAN
TUNISIA
TURKEY
UKRAINE
URUGUAY
VANUATU
VENEZUELA
ENGR 101 Interview an Engineer

Possible Questions ...

1. Describe the typical day at work.
2. What kinds of engineering problems do you encounter?
3. How much school course work is used in your job – i.e., do you use calculus and physics on the job?
4. What courses from school were most useful to you on the job?
5. What courses from school have been least useful?
6. What is the work environment like? (friendly, formal, etc.)
7. What are the people like? How is conflict dealt with?
8. What is satisfying / dissatisfying in the job?
9. Do you think you are paid equitably?
10. What do you think the trends will be in your field?
11. Knowing what you know now about your profession, would you still choose to pursue it? What would you do the same / differently?
12. What is the “corporate culture” at work? Is there one?
13. Are there any special commitments in your job – e.g., travel, overtime, social events, frequent relocations?
14. What are the future prospects for engineers in this country?
15. If you were in my shoes, how would you enter the profession?
16. What do you like best / least about working as an engineer?
17. What do you think makes a “good” engineer?
18. How important are writing and communication skills?
19. Describe you toughest job assignment.
20. What one piece of advice could you offer to prospective engineers?
21. Has the profession lived up to your expectations? Why / why not?
22. Is there flexibility in the engineering profession in terms of performing different types of jobs?
in engineering promises, you'd think that college students would be declaring engineering majors in droves.

I guess engineering really is a unique and highly selective profession. Consider yourself lucky to be one of the "chosen few."

Ray's Top Ten List

1. Job Satisfaction
2. Varied Opportunities
3. Challenging Work
4. Intellectual Development
5. Social Impact
6. Financial Security
7. Prestige
8. Professional Environment
9. Understanding How Things Work
10. Creative Thinking

1. Job Satisfaction

What would you say is the #1 cause of unhappiness among people in the United States? Health problems? Family problems? Financial problems? No. Studies have shown that, by far, the #1 cause of unhappiness among people in the U.S. is job dissatisfaction.

Do you know people who dislike their job? People who get up every morning and wish they didn't have to go to work? People who watch the clock all day and can't wait until their workday is over? People who work only to earn an income so they can enjoy their time off? Maybe you have been in one of these situations. Lots of people are.

Throughout my career, it has been very important to enjoy my work. After all, I spend eight hours or more a day, five days a week, 50 weeks a year, for 30 or 40 years working. This represents about 40 percent of my waking time. Which would you prefer? Spending 40 percent of your life in a career (or series of jobs) you despise? Or spending that 40 percent in
SECTION 2: ENGINEERING ACADEMICS
# EDUCATION REALLY PAYS

National average annual earnings by education level for persons 18 yrs old and older in 1999 US Census

<table>
<thead>
<tr>
<th>Level of Education</th>
<th>Average per month 1999</th>
<th>Average per year 1999</th>
<th>Total over 35 year career (3% pay increases annually)</th>
</tr>
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<tbody>
<tr>
<td>Less than High School Diploma</td>
<td>$1,343</td>
<td>$16,121</td>
<td>$974,709</td>
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<td>High School Diploma</td>
<td>$2,048</td>
<td>$24,572</td>
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<td>Some college no degree</td>
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<td>$26,958</td>
<td>$1,629,937</td>
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<td>$32,152</td>
<td>$1,943,977</td>
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<tr>
<td>Bachelor's Degree</td>
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<td>$52,883</td>
<td>$3,197,416</td>
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<tr>
<td>Master's Degree</td>
<td>$4,637</td>
<td>$55,641</td>
<td>$3,364,171</td>
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<tr>
<td>Doctorate Degree</td>
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<td>$86,833</td>
<td>$5,250,104</td>
</tr>
<tr>
<td>Professional Degree</td>
<td>$8,416</td>
<td>$100,987</td>
<td>$6,105,884</td>
</tr>
</tbody>
</table>

THE VALUE OF AN ASSOCIATES DEGREE
✓ 60 units to get an Associates degree
✓ Associates degrees earn $458,303 more than High School Diplomas
✓ Value of $7,638 per unit over lifetime
✓ Would you get an Associates degree if someone offered you $424 dollars per hour to take an 18-week class?

THE VALUE OF A BACHELORS DEGREE
✓ 124 units to get a Bachelors degree
✓ Bachelors degrees earn $1,253,439 more than Associates degrees
✓ Value of $10,108 per unit over lifetime
✓ Would you continue on for a Bachelors degree if someone offered you $562 per hour to take an 18 week class?

Income information from US Census Bureau, March 2000, Table 9

Created by Mary Beth Rogers, MA, NCCC
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**Ray’s Top Ten List**

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Helpful Hints

1. Use large quantities of paper (it can be recycled). Much time (and paper) is wasted by doing several steps at one time and trying to cram ones work into a small space. Write clearly, leave plenty of space between lines as you attempt to solve problems, do only one step per line (or at most a few steps), and box solutions.

2. Read the textbook before class. It will make the course much easier.

3. Do your homework promptly (soon after the lecture). It can make the homework assignment much easier.

4. If you do poorly on an exam, try to understand the material as soon as you can. Understanding the old material is necessary to understanding new material. Also, you will do better on the final if you don’t wait until the last minute to understand old material.

5. Attend every class.

Hints for Taking a College Exam

1. Take a quick look at all of the problems to see how long the exam is. This will give you some idea of how fast you need to work to complete the test.

2. Start working on the “easiest” problems first by either:
   A) Look through the test and solve only the problems that are easy for you;
   or,
   B) Attempt to do the problems in the order given, but only solve the problems that are easy for you.
   (Note: a problem is “easy” if you are confident that you can solve it and it will take a short amount of time.)

3. After doing the “easiest” problems on the first pass through the test, do a second pass through the test doing problems that are the “second easiest”.

4. After doing the “second easiest” problems on the second pass through the test, do a third pass through the test doing problems that are the “third easiest”; etc.

5. You should not spend a long time trying to solve a problem; if a problem is turning out to be difficult to solve, move on to another problem and go back to the more difficult problems later (by the time you go back to a problem you may have remembered how to solve it).

6. Be sure to write down something for every problem on the test (just writing down the first steps, a relevant equation, or an explanation of the method to be used to solve a problem can yield partial, or nearly full, credit).

7. Do not erase your work. If you wish to try another method or approach, attach additional sheets of paper. You may discover later that your first method was correct (many times students erase the correct answer).

8. On a physics or engineering exam, begin all calculations with a defining equation (this step is necessary in order to receive full credit on my exams).

9. Ask questions if you are stuck — the instructor may help you to get started or remember something.
SECTION 3: COMPUTER ASSIGNMENTS
ENGR 101 Excel Assignment – GPA Calculation

The attached Excel spread-sheet shows the grades of a hypothetical engineering student over 4 semesters. The assignment is to compute the semester GPA’s and the overall GPA’s for each of the 4 semesters, using calculations in Excel.

Grade Values and Grade Points are calculated as follows:

Grade A → Grade Value = 4.000
Grade B → Grade Value = 3.000
Grade C → Grade Value = 2.000
Grade D → Grade Value = 1.000
Grade F → Grade Value = 0.000

<table>
<thead>
<tr>
<th>Class</th>
<th>Units</th>
<th>Grade</th>
<th>Grade Value</th>
<th>Grade Points</th>
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<td>Math 150</td>
<td>5.0</td>
<td>B</td>
<td>3.000</td>
<td>15.000</td>
</tr>
<tr>
<td>Physics 102</td>
<td>4.0</td>
<td>A</td>
<td>4.000</td>
<td>16.000</td>
</tr>
<tr>
<td>G.E. 1</td>
<td>4.0</td>
<td>C</td>
<td>2.000</td>
<td>8.000</td>
</tr>
<tr>
<td>G.E. 2</td>
<td>3.0</td>
<td>B</td>
<td>3.000</td>
<td>9.000</td>
</tr>
<tr>
<td>Total</td>
<td>16.0</td>
<td></td>
<td></td>
<td>48.000</td>
</tr>
</tbody>
</table>

The semester GPA = (Total Grade Points) / (Total Units)
= (48.000) / (16.0)
= 3.000

The overall GPA is the unit weighted average of the semester GPA’s. For instance, if you received a 3.000 GPA the first semester when you took 16.0 units, and you received a 4.000 GPA the second semester when you took 13.0 units, your overall GPA would be:

The overall GPA = (16.0 * 3.000 + 13.0 * 4.000) / (16.0 + 13.0)
= 3.448

(Note that the overall GPA is also the total grade points divided by the total units.)

Note: Be sure to do a print preview first – you should be able to adjust the margins to fit on one page (you can also add your name to the header, or just put it on the first line).

Please staple this sheet to the front of your finished excel spread sheet.
<table>
<thead>
<tr>
<th>Semester</th>
<th>Class</th>
<th>Units</th>
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<th>Grade Value</th>
<th>Grade Points</th>
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<tbody>
<tr>
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<td>GE 1</td>
<td>4.0</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>GE 2</td>
<td>3.0</td>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Units =</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Semester GPA =</td>
<td></td>
<td></td>
<td>(calculate)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Overall GPA =</td>
<td></td>
<td></td>
<td>(calculate)</td>
<td></td>
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<tr>
<td>Spring 2007</td>
<td>Math 160</td>
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<td>B</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Physics 121</td>
<td>5.0</td>
<td>B</td>
<td></td>
<td></td>
</tr>
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<td></td>
<td>Chem 155</td>
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<td></td>
<td>Total Units =</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Semester GPA =</td>
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<td></td>
<td>(calculate)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Overall GPA =</td>
<td></td>
<td></td>
<td>(calculate)</td>
<td></td>
</tr>
<tr>
<td>Fall 2007</td>
<td>Math 200</td>
<td>4.0</td>
<td>C</td>
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<td></td>
<td>Physics 122</td>
<td>5.0</td>
<td>A</td>
<td></td>
<td></td>
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<td>Total Units =</td>
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<tr>
<td></td>
<td>Semester GPA =</td>
<td></td>
<td></td>
<td>(calculate)</td>
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<td>(calculate)</td>
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<td>Spring 2008</td>
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<td>C</td>
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<td></td>
<td>Semester GPA =</td>
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<td>(calculate)</td>
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<tr>
<td></td>
<td>Overall GPA =</td>
<td></td>
<td></td>
<td>(calculate)</td>
<td></td>
</tr>
</tbody>
</table>

**EXTRA CREDIT:** Next semester, 12.0 units.
Can student get a 3.300 GPA?
ENAMEL 101 Excel Assignment – Grade Calculation

The attached Excel spread-sheet shows the scores of 10 hypothetical students in an engineering class. The assignment is to compute the overall percentage and final grade for each of the 16 students in the class, using calculations in Excel.

The grading is as follows:

**GRADING:**
Coursework 12%
Quizzes 15%
Exams 50%
Final 15%
Project 8%
Total 100%

A: 90–100%
B: 80–89%
C: 70–79%
D: 60–69%

*Note: Be sure to do a print preview first – you should be able to adjust the margins to fit on one page.*

Please staple this sheet to the front of your finished excel spread sheet.
<table>
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<th>Name</th>
<th>CW</th>
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<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Q5</th>
<th>Q6</th>
<th>Q7</th>
<th>Q8</th>
<th>Q9</th>
<th>Q10</th>
<th>Quiz Score</th>
<th>E1</th>
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<th>E3</th>
<th>E4</th>
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<th>Final</th>
<th>Project</th>
<th>Overall</th>
<th>Overall Grade</th>
<th>Name</th>
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<td>Student #10</td>
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</tr>
</tbody>
</table>
GETTING STARTED:
- MatLab is loaded on several computers around campus, including the Physical Sciences Computer Lab, the Mathematics Computer Lab, and the Computer Science Lab.
- Use a thumb drive, or other memory device, or email the files to yourself. Click on the “MatLab 6.5” shortcut on the computer "Desktop" – if the shortcut is not there, then click on “start” (lower left corner) → “All Programs” → “MatLab 6.5” → “MatLab 6.5”.

MATLAB OVERVIEW:
- MatLab has 3 basic components:
  1) Command Window
  2) Plot Window
  3) m-files (for saving your commands as files so that you can use them again – the m-file actually becomes a command recognized by MatLab, in fact, all MatLab commands are written as m-files)

MATLAB COMMANDS:
- The MatLab “command” window should appear showing the MatLab command prompt >>
- Try entering the following commands into the command window (see why it is called the command window):
  >> x = [0 1 2 3 4]
  >> y = [0 1 4 9 16]
  >> plot(x,y)
- Close the figure window (the plot window) when you are done.

Note: Instead of writing the x-values as "x = [0, 1, 2, 3, 4]", you could write the x-values as "x = [0:4]".

CREATING M-FILES:
- The area showing the “Current Directory” should start at “C:\MATLAB6p5\work”. If you are using a thumb drive (or other portable memory device), click on the “…” button to browse to change directories to your thumb drive (or other portable memory device).
- >> pwd (to see the working directory – should be the your thumb drive).
- >> dir (to see the contents of the current directory).
- Use the MatLab file editor (the MatLab file editor can be utilized by clicking on the "File" pull down menu, then click on "New", then move the pointer to the right and click on "M-file", to create a new file.
- Type the following in your new file (the first line is a comment line, not a command line – comment lines start with the % symbol – note that there is no >> symbol before the command lines in the file):
  %test1.m
  clear
  x = [0, 1, 2, 3, 4]
  y = [0, 1, 4, 9, 16]
  plot(x,y)
• Click on the “File” button, then click on the “Save As” button. Choose your thumb drive within the “Save In:” area. Then type the name of the program in the "File name:" area – the MatLab editor will add the ".m” extension, so just name the file "test1”.

• **IMPORTANT NOTE:** Filenames must not have any blank spaces, they must begin with a letter, and contain only lowercase letters or numbers. Do not use special characters such as "?", "<", etc. The file must end with the ".m” extension to be recognized by the MatLab command window (note that the .m extension is added automatically by the MatLab editor).

• You may also use a simple editor such as "notepad" to create and modify m-files (NOTE that the name of the file must include the ".m” extension must be saved in double quotes, e.g., "test1.m", to avoid having an additional extension of .txt).

**RUNNING AN M-FILE FROM THE COMMAND PROMPT (>>):**

- >> dir  (to see the contents of the current directory; the file you created, test1.m, should be shown; there should not be a .txt extension after the .m extension).
- >> test1  (type test1, without the .m extension, to run the m-file program; note that the m-file executes the commands, with the advantage that you can save and modify the file; once the m-file is created, you can modify it with other editors, if you like).

• Close the figure window (the plot window) when you are done.

**OTHER M-FILES TO TRY** (use the “Save As” command to re-save your file with a new filename):

- Smoother parabola:
  
  ```
  %test3.m
  clear
  x = [0 : 0.2 : 4]
  y = x.*x
  plot(x,y)
  ```

- To avoid printing all of the x values and y values in the command window, the ; used at the end of a matrix suppresses echoing (printing in the command window):
  
  ```
  %test4.m
  clear
  x = [0 : 0.1 : 4];
  y = x.^2;
  plot(x,y)
  ```

- A very handy command is figure(gcf). This command brings the plot window to the front each time:
  
  ```
  %test5.m
  clear
  x = [0 : 0.1 : 4];
  y = x.^2;
  plot(x,y); figure(gcf);
  grid
title('Plot of Parabola Section')
xlabel('x values')
ylabel('y values')
```
ENGR 101 - MatLab Assignment #1
M-Files and Plotting

Please refer to the document, "MatLab — Getting Started". If you get stuck, please come see me for help.

Create an m-file as follows (note that MatLab uses angles measured in radians):

```matlab
% sine_wave_plot.m
% Created by "YOUR NAME" on "TODAY’S DATE"
clear
x=[0:0.01:4*pi];
y=sin(x);
plot(x,y)
title('Plot of a Sine Wave')
ylabel('y values')
xlabel('x values')
grid on
figure(gcf)
```

Turn in three pages:

#1 This sheet stapled to the front of your work.
#2 Print out of the m-file (called the "source code")
#3 Print out of the plot (be sure to edit the plot to add your name as text somewhere in the plot).
ENGR 101 - MatLab Assignment #2
Random Roll of 1 Die and a Pair of Dice

Please refer to the document, "MatLab - Getting Started". If you get stuck, please come see me for help.

#1) Write an m-file named roll_1.m to calculate the roll of one die. To help you get started, type help for the following functions:
   rand
   round
   ceil
   floor

#2) Modify your m-file to plot a histogram for 100 rolls of one die (be sure to add a title, and label the axes). To help you get started, type help for the following functions:
   hist

Hints: You may find it helpful to use the function rand as a vector, e.g., rand(1,100). You can set the bins to predetermined values in the hist function.

Turn in the source code (print out the m-file - be sure to add your name as a comment) and plots of two histograms (one for 60 rolls, one for 60,000 rolls). NOTE: BEFORE PRINTING, be sure to edit your histogram plots and choose "No Color" to avoid using excessive ink from the printer, and edit the plot to add your name as text somewhere in the plot.

#3) Using "Save As", save your m-file as a new m-file named roll_2.m, and modify it to calculate the roll of a pair of dice.

#4) Modify your m-file to plot a histogram for 1,000 rolls of a pair of dice (be sure to add a title, and label the axes).

Turn in the source code (print out the m-file - be sure to add your name as a comment) and plots of two histograms (one for 360 rolls, one for 360,000 rolls). NOTE: BEFORE PRINTING, be sure to edit your histogram plots and choose "No Color" to avoid using excessive ink from the printer, edit the plot to add your name as text somewhere in the plot.

STAPLE THIS SHEET TO THE FRONT OF YOUR WORK.
SECTION 4: INTERNSHIPS
South Coast

CMST
California Mathematics and Science Teacher Initiative

- Do you like working with students?
- Are you interested in teaching mathematics or science?
- Would you like to work with outstanding teachers in local secondary schools?

Then apply to become a 2004-05 Mathematics or Science Teaching Intern!

This internship program presents a unique opportunity for students considering a teaching career to gain actual teaching experience in classrooms. In collaboration with university/college faculty and outstanding local teachers, interns will participate in an exciting program providing hands-on mathematics and science teaching experiences in cooperative student group settings. Students from underrepresented ethnic groups and bilingual students are particularly encouraged to apply.

Qualifications:
- Must be a student who has taken at least two semesters/three quarters of Calculus and/or two semesters/three quarters of college level science courses, with an interest in mathematics or science teaching.
- Must be currently enrolled full-time student during the 2004-05 academic year.
- Must have a desire to work with local students from underrepresented groups in grades 7 - 12.
- Must be able to successfully complete and be qualified under the Character and Identification Form (attached).

Responsibilities:
- Attend workshops and seminars in mathematics and science education during the 2004-05 academic year.
- Work with students in mathematics/science classes in secondary schools an average of 7-8 hours per week.
- Prepare and present a teaching portfolio and final report.

Selected interns will be paid a total of $2,500 (gross taxable support) while others will be invited to volunteer in the program with support for school clearance and materials. Project participation depends upon receipt of funding for 2004-05

Due Date: Friday, April 23, 2004
Seminars and Workshop Opportunities may include:

- Effective teaching strategies with an emphasis on those that actively involve students in exploring science and mathematical ideas.
- Use of manipulatives and technology in experiential learning and problem solving.
- Discussions with university/college faculty, outstanding local teachers, and other students on current issues in mathematics and science education.
- Strategies to increase the mathematics and science achievement of Limited English Proficiency (LEP) and English as a Second Language (ESL) students.
- UCSB Mathematics Interns must attend Mathematics 195A & B - Internship in Mathematics Teaching during Winter and Spring Quarters and may enroll for credit.

HOW TO APPLY:

Please submit the following (USE ATTACHED FORM):

1. Your name, local address, and local phone number.
2. Your class level, expected graduation date, and major.
3. A list of mathematics and science courses taken including name of instructor and course grade.
4. Your overall GPA and your mathematics or science GPA.
5. An unofficial transcript.
6. Names and phone numbers of two references (letters not required).
7. Description of skills and experience working with students, especially students from underrepresented groups (for example, language skills, tutoring, summer camp counselor, church or community group leader).
8. A one-page explanation stating why you would like to become a 2004-05 Mathematics or Science Teaching Intern.

For more information contact:

Miguelangel N. Arellano at 893-8801, South Hall 6607 (arellano@math.ucsb.edu)

or

Professor Kenneth C. Millett at 893-3894, South Hall 6512 (millett@math.ucsb.edu)

This project is funded by the University of California's California Mathematics and Science Teacher Initiative. It is administered by UCSB CMSTI in cooperation with the UCSB Gevirtz Graduate School of Education and the Department of Mathematics. This work is undertaken in collaboration with Allan Hancock College, Oxnard College, Santa Barbara City College, and Ventura College and the following school districts, Santa Barbara Elementary and High School District, Santa Maria-Bonita School District, Oxnard Union High School District, Hueneme School District, Ventura Unified School District, Santa Paula Union High School District, and Fillmore Unified School District.
Looking for an Exciting Summer Research Experience in Science and Engineering?

Apply to the Internships in Nanosystems Science, Engineering and Technology (INSET) Program!

Summer Undergraduate Research Experience for Community College Students

Hosted by the California NanoSystems Institute (CNSI) at the University of California Santa Barbara.

This internship program brings science and engineering community college undergraduates to the UC Santa Barbara campus for a summer research experience. Interns gain first-hand experience in scientific investigation in a dynamic, collaborative research environment. They are individually matched with UCSB faculty and graduate student lab mentors who will provide training and support. Interns attend weekly meetings, special seminars, and have the opportunity to develop their presentation skills throughout the summer.

- The stipend for undergraduate interns is $2,800 total for 8 weeks at 35 hrs/week.
- Free housing and travel costs to and from the UCSB campus will be provided.
- Program dates are June 20th - August 12th 2005

Visit our web site for complete information and to download the application form:

http://www.cnsi.ucsb.edu
Or email Trevor Hirst at hirst@cnsi.ucsb.edu

Application Deadline is February 28th 2005
Expanding Pathways to Science, Engineering & Mathematics

July 31 – August 13, 2005

The California NanoSystems Institute (CNSI) is a science and engineering research center at UC Santa Barbara. Research at CNSI includes faculty, students and postdocs from 11 different academic departments, including chemistry and biochemistry, physics, biology, engineering, materials science, and computer science. CNSI research determines new ways of integrating nanometer-scale building blocks into new materials, devices and systems with capabilities far exceeding those found in nature.

The EPSEM program brings science, engineering, and mathematics high school and college students to the UC Santa Barbara campus for the EPSEM Summer Institute, a 2-week science intensive residential program hosted by CNSI. EPSEM will provide university housing and meals on campus. You will have the opportunity to interact with science, engineering, and mathematics researchers through social, academic, and professional development activities such as...

- Work in teams on lab projects
- Learn new strategies for academic and transfer success
- Team Project design/problem solving
- Discuss career options with professionals
- Develop leadership skills
- Participate in field trips to industry and the university reserve system
- Practice your public speaking skills
- Teamwork

Application Deadline: Friday, April 1, 2005 --> Extended to April 15
On-line applications – see the back of this sheet for application instructions and URL’s.

For more information: www.epsem.ucsb.edu
M. Ofelia Aguirre – EPSEM Coordinator
Phone: (805) 893-7472 Email: aguirre@cnsi.ucsb.edu
Program Details

- The EPSEM SI runs July 31 - August 13, 2005
- University housing is provided at the Santa Ynez Apartments
- All meal provided in one of the University dining halls
- EPSEM Stipend - $400
- Students required to attend and actively participate in the entire period, weekends included

Undergraduate Students

- Must attend a California Community College or UCSB.
- Must have science, engineering, or mathematics as their current or intended major.
- Must be 18 years or older by July 31, 2005.
- Must be a US citizen or permanent resident

All applicants must complete all of the following:

- A statement of interest explaining why you are interested in the EPSEM Summer Institute and how you can contribute and/or benefit. In particular, we would like to know about your interest in science and your ability to work with groups of people. BE SPECIFIC - for example, you might discuss how a particular experience or person inspired you to study science. Your statement should be typed, and at most one page long.
- Submit a copy of your unofficial transcript. If you are currently attending a community college and have completed 16 transferable semester units or more, then do not submit your high school transcripts. However, you must submit transcripts from all the colleges you have attended.
- A letter of recommendation from a course instructor, TA, or employer who is familiar with your scientific skills. You may send up to 2 letters, but only 1 is required. An electronic version of the form letter may be downloaded as a pdf file:


  or as a word document:::

  http://www.epsem.ucsb.edu/summer_programs/epsemsi/documents/recommendation.doc

- Your statement of interest, transcript(s) and recommendation letter(s) may all be submitted via e-mail to aguirre@cnsi.ucsb.edu. Acceptable file formats for attachments are MS Word and Adobe Acrobat (pdf) only.

Documents may also be mailed to:
M. Ofelia Aguirre - EPSEM Program
California NanoSystems Institute
Santa Barbara, CA 93106-6105
Hi folks,
Seymour Duncan is hiring part-time job 3:30-6 pm M-F temp job testing electronic pick up gear (guitars) student should have tech expertise with audio generator, oscilloscope, multimeter, voltmeter, ohmmeter, gauss meter and distortion analyzers. pay is $12-14 hr. Second bench opening up in April and student could work more hours at that time. students should e-mail resumes to sabinam@seymourduncan.com
Hope you had a swell break!
Deborah

Deborah Gentry, Worksite Coordinator
Career Advancement Center
Santa Barbara City College
gentry@sbcc.edu
805.965.0581 x 2333
Mechanical Engineering Energy Institute
Cal Poly State University, San Luis Obispo. Summer 2005

Sponsored By: Cal Poly Conference Services, Cal Poly Mechanical Engineering Department, and industry sponsors.
What, Where, and When: One-week workshops will be held on Cal Poly campus in San Luis Obispo during summer. The workshops are planned for June 19-24, 2005.

Mission:
1) To learn about energy use, conservation and resource issues.
2) To gain an understanding of renewable and non-renewable energy technologies.
3) To experience an energy industrial setting via field trips.
4) To help identify academic programs offering degrees in petroleum and energy engineering and other related fields.
5) To help understand career opportunities with oil & gas and other energy industries.
6) To experience Cal Poly's unique hands-on teaching experience.

Who is Attending?
High school students (grades 11, 12)
High school teachers with interest in math, physics and engineering
Community college students with interest in engineering
University engineering students
All applications will be reviewed, and a governing board consisting of representatives from MEEI and industry will select attendees. Selection criteria are based on GPA, transcript, letter of interest, and other scholarly activities.

Workshop Description:

Day 1 (Sunday): Participants arrive Sunday afternoon at 3:00 PM and check in to dorms. Dinner reception to follow.

Day 2 (Monday):
Morning & Afternoon: Industry presentations on petroleum geology, oil and gas Production, refinery engineering, and wind energy.

Day 3 (Tuesday):
Morning & Afternoon: Energy from Oil and gas. Lecture and lab activities.
Day 4 (Wednesday):
Morning & Afternoon: Field trip to industrial settings.

Day 5 (Thursday)
Morning & Afternoon: Renewable energy sources. Lecture and lab activities.
A visit to Farmer's Market in San Luis Obispo.

Day 6 (Friday)
Morning: Energy from fuel cell. Program evaluation. Luncheon ceremony.

What will be provided to the selected participants?
1) Room and board for duration of stay at Cal Poly facilities.
2) Daily breakfast, lunch, and dinner.
3) Workbooks, lab supplies, and participation certificates.

Number of participants?
25-30 per week

Cost?
The program costs $1000.00 per person. MEEI will cover half of the cost of selected high school students and all of the cost of college and university students based on total funding available.

Contact Person:
Professor Mason Medizade
Director, Mechanical Engineering Energy Institute
Mechanical Engineering Department
Cal Poly State University; San Luis Obispo, CA 93407
(805) 756-1345, (805) 756-1137 (FAX)
email: mmedizad@calpoly.edu
APPLICATION DEADLINE: May 9, 2005
WEB:
SECTION 5: APPENDIX
Career Planning Classes

♦ NEED HELP CHOOSING A MAJOR?
♦ SETTING EDUCATIONAL GOALS?
♦ EXPLORING CAREER GOALS?

SBCC's Career Planning classes help hundreds of people every year make career choices.

PerDy 191A
(1 UNIT, 18 HOURS)
Choose from self-paced class or on-line class.

PerDy 110
(3 UNITS, 18 WEEKS)
Develop Career Goals, Choose a Major, Learn Job Search Skills

All of these courses are CSU transferable.

Do yourself a favor and sign up NOW!
Resume Essentials

1. Be positive
2. Be brief
3. Avoid any negative statements
4. Avoid technical jargon and abbreviations
5. Tailor your demonstrated abilities to each specific position
6. Include campus and community volunteer experience
7. Quantify increased sales or time or money saved
8. Keep a 1-1/2” margin on all four sides of the page
9. Limit resume to one page; two pages are appropriate only in unusual cases
10. Capitalize major headings
11. Single space between lines
12. Keep phrases short, avoiding use of subjects or personal pronouns. Start phrases with verbs, using the list provided in this workbook
13. Omit mention of salary or wages
14. Correct all spelling errors
15. Make sure the resume looks neat and attractive
16. Do not mention reasons for leaving previous positions
17. Do not include references – save them for the interview
18. Save your resume on a diskette
19. Have several versions of your resume, each targeting a different area of interest.
20. ALWAYS include an objective – it helps you to avoid being considered for positions that do not interest you. It also helps the employer to perceive you as someone who knows what they want in a job

Printing Your Resume

A. Use standard 8-1/2” x 11” paper
B. Use a clear, easy to read font
C. Use high quality bond stationery in classic colors
D. Laser printing gives the best results; dot matrix printer or typewriter are far inferior alternatives
Five Questions

Consider these questions when developing your resume:

Q: What experience have you had working with numbers?
Tip: Your resume should show numeric literacy. Examples are: Work with accounts, handled cash, performed numeric filing/data entry, completion of statistics or algebra class.

Q: How would you describe your communication skills?
Tip: Employers are looking for how you interact orally and in writing. Examples are: experienced in customer service, operated a switchboard, acted as receptionist, completion of English, Communications, or Journalism classes.

Q: What are your computer skills?
Tip: Make a list of the computer programs you know and whether or not you are comfortable using the Internet for research purposes.

Q: Are you fluent in any languages other than English?
Tip: Don’t discount language classes you’ve taken just because you can’t write the language fluently. Often employers are happy with conversational ability.

Q: How have you contributed to a group or team project?
Tip: This can include active participation at staff meetings, class projects, or involvement in collegiate team sports.

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FORMATS

There are three main resume formats: chronological, functional, and combination. Each is defined by the way it organizes your experience. Choose the one that shows your experience to its best advantage.

**Chronological**

This type is most common, organizing your experience around the jobs you have held. This format is an excellent choice for people with steady work histories or previous jobs that relate closely to their objective.

List each position you have held, starting with the most recent and working backward. For each position, give the title of the job, organization name, and years you worked there. Next, list the duties and accomplishments of that job, beginning each statement with a strong verb.

Be specific, but not overly detailed, in describing what you did. Employers say that three to five statements are usually sufficient for each job.

Because the chronological format emphasizes dates and job titles, it can be a poor format for career changers, people with inconsistent work histories, or new entrants to the work force. For these applicants, the functional resume is a better choice.

**Functional**

The functional resume organizes your experience around skills rather than job titles. Therefore, it is recommended for people who have not held positions that relate directly to the job they want. By focusing on skills, you can connect less relevant jobs to the required job qualifications.

Identify 3-4 skills required for your target job, and then identify 3-5 concrete examples to demonstrate each skill. Use action phrases rather than complete sentences when writing your list.

Arrange your skill headings in order of importance. Match the arrangement of your headings to that of the job’s listed requirements. The closer your skill headings match with the reviewer’s expectations, the more qualified you appear.

Finally, include a brief work history. Write only job titles, company names, and employment years. Use the cover letter to explain any gaps in your work history.

**Combination**

This format combines the best of the chronological format with the best of the functional format. There are many different ways to do this, so most of the following samples are examples of this type. Construct your combination resume to highlight your skills and experience that are most relevant to the requirements of the position.

**Scannable**

Any of the above formats can be adapted to become a “scannable” resume. A scannable resume is one that takes advantage of computer technology. The resume is scanned into the employer’s computer, which then searches for keywords (nouns labeling your skills) that match with requirements of the position. See the provided sample for more information.
RESUME WORKSHEET

NAME ____________________________________________

ADDRESS__________________________________________

CITY/STATE/ZIP____________________________________

PHONE (  )_______________________________________

E-MAIL____________________________________________

JOB OBJECTIVE
(State the title of the job you are seeking.)

____________________________________________________

EDUCATION
(List schools you have attended, starting with the most recent)

School __________ City/State __________ Dates Attended _________ Degree _________
(List those courses you took which are relevant to the position you are seeking. Include GPA of 3.0 or higher. List relevant special projects and awards.)
____________________________________________________
____________________________________________________

School __________ City/State __________ Dates Attended _________ Degree _________
(List those courses you took which are relevant to the position you are seeking. Include GPA of 3.0 or higher. List relevant special projects and awards.)
____________________________________________________
____________________________________________________

WORK HISTORY
(List your full-time, part-time, summer, charitable or volunteer jobs. Start with the most recent job.)

Date ______ to ______ Your Title or Position________________________________________

Company’s Name ______________________________________ City/State________________

Duties____________________________________________________

____________________________________________________
Date _____ to _____ Your Title or Position

Company's Name __________________________ City/State __________________

Duties ____________________________________

Date _____ to _____ Your Title or Position

Company's Name __________________________ City/State __________________

Duties ____________________________________

Date _____ to _____ Your Title or Position

Company's Name __________________________ City/State __________________

Duties ____________________________________

Date _____ to _____ Your Title or Position

Company's Name __________________________ City/State __________________

Duties ____________________________________

PERSONAL INFORMATION
This section is optional and can include special talents, languages, community involvement and public service. (Do not list membership in organizations which denote race or religious affiliation.)

REFERENCES
Available upon request.
Anita Spaulding
260 Maple Street
Santa Barbara, CA  93102
(805)555-0260
anita@veri.net

OBJECTIVE:  A part-time retail sales position

EDUCATION:  Santa Barbara City College
August 2001 - present
Pursuing Associate of Arts in Liberal Studies
Expected date of graduation: June 2003

WORK EXPERIENCE:  
Cashier, CheapStuff, Santa Barbara, CA
June 2001 - present
• Scan merchandise being purchased by customers
• Assist customers with purchases by cash, credit card, check, and debit card
• Handle return of items by customers
• Assist customers in finding items in store

Team Member, Burgers & More!, Santa Barbara, CA
March 2001- June 2001
• Took and filled customer orders
• Made change
• Cleaned off tables throughout my shift

REFERENCES:  Available upon request.
Sample Combination Resume

Frank Bogart
88 Harbor Place
Santa Barbara, Ca. 93109
805-683-2105
bogart@yahoo.com

Objective: Seeking a position as Assistant or Sous Chef

Summary of Qualifications:
Restaurant experience: broiler, grill, seafood, soups, salads, desserts
Able to handle a multitude of tasks and meet deadlines under pressure
Demonstrated ability to be productive in a fast-paced environment
Cooperative worker with customers, staff, supervisors

Experience:
Broiler/Prep Cook                               September 1994 – present
Jacques Restaurant, Ventura, Ca.
200-seat Four Diamond restaurant featuring French and American
  cuisine

The Lobster Net, Santa Barbara, Ca.
Indoor and outdoor dining, specializing in fresh seafood with
  takeout and banquet service

Education:
Associate Degree in Culinary Arts June 1992
Santa Barbara City College, Santa Barbara, Ca.
Curriculum and Training included:
  American Cuisine
  International Cuisine
  Yarde Manger
  Classical Bakeshop
  Dining Room Management

References:
Available upon request.
Sample Functional Resume

Manuel Morales
3589 Oak Avenue
Santa Barbara, CA 93102
(805)555-3589
mannvm@veri.net

OBJECTIVE: An entry-level position on a computer helpdesk

EDUCATION: Santa Barbara City College
Certificate, PC Support/Network Management
December 2001

Applicable Courses:
- Operating Systems: Novell NetWare
- Operating Systems: Windows NT
- Computer Technical Support
- MS Windows Systems Administration

EXPERIENCE:

Technical:
- Working knowledge of DOS, Windows, UNIX, Novell NetWare, and Windows NT
- Expert in upgrading and troubleshooting PCs
- Able to manage users, groups, and resources available in a network

Customer Service
- Proficient at interviewing clients to determine needs
- Demonstrated ability to work as a team member
- Bilingual Spanish and English

Computer Applications
- Expert in Microsoft Office XP Pro (Word, Excel, Access, PowerPoint, and Outlook)
- Working knowledge of Dreamweaver

WORK HISTORY:
Manager's Assistant, Abe's Bagels, Goleta, CA, 1998 – present
Produce Clerk, Shop Quick, Lompoc, CA 1997-1998

REFERENCES: Available upon request.
Sample Combination Resume

Manuel Morales
3589 Oak Avenue
Santa Barbara, CA 93102
(805)555-3589
mannym@veri.net

OBJECTIVE: Entry-level position on a computer helpdesk

EDUCATION: Santa Barbara City College
Certificate, PC Support/Network Management
December 2001

Applicable Courses:
• Operating Systems: Novell NetWare
• Operating Systems: Windows NT
• Computer Technical Support
• MS Windows Systems Administration

SPECIAL SKILLS:
• Working knowledge of DOS, Windows, UNIX, Novell NetWare, and Windows NT
• Able to manage users, groups, and resources available in a network
• Proficient at interviewing clients to determine needs
• Expert in upgrading and troubleshooting PCs
• Demonstrated ability to work as a team member
• Bilingual Spanish and English

WORK EXPERIENCE: Manager’s Assistant, Abe’s Bagels, Goleta, CA, 1998 – present
Started as baker, promoted to head baker, shift supervisor, and manager’s assistant
• Interviewed and hired employees
• Tracked employees’ performance and development
• Developed employee work schedule
• Coordinated production levels

Produce Clerk, Shop Quick, Lompoc, CA 1997-1998
• Sorted and arranged produce for display

REFERENCES: Available upon request.
Sample Combination Resume

Colleen L. Fisk
27 Wall Street, Santa Barbara, CA 93102
(805)555-3102, fiskc@veri.net

OBJECTIVE: Seeking a position in horticulture

EDUCATION: Santa Barbara City College
A.S. in Environmental Horticulture expected June 2002

Relevant Coursework:
- Irrigation/Garden Waterworks
- Plant Identification and Culture
- Nursery & Specialty Enterprises
- Soils & Plant Nutrients
- Landscape Construction
- History of Gardens
- Landscape Drafting
- Landscape Maintenance

RELEVANT EXPERIENCE:
The Santa Barbara City College Restoration Project,
1999-present
Duties include:
Work with groups of people planting and maintaining
native species, eradication of exotics and erosion control;
Monitor native species;
Compile photographic field guide for use in identifying
desired endemic species.

WORK HISTORY:

Tile setting: Design, layout, and install ceramic tile.
Freelance installation of all types of ceramic tile,
including large saltillos, marble, and custom hand-painted
murals.

Construction: Read plans, layout, and construction of
projects.

Freelance photography: Skills include scenics,
portraiture, team pictures, and technical photography.

REFERENCES: Available upon request.
Sample Combination Resume

Michong Young
348 Walnut Boulevard
Santa Barbara, CA 93102
Telephone: 805-555-0348   E-mail: colleen@veri.net

Objective:
An entry-level accounting position.

Education:
A.S. in Accounting
Santa Barbara City College, June 2001

Relevant Coursework:
Financial Accounting       Managerial Accounting
Microeconomics             Managerial Finance
Business Communications

Computer Skills:
QuickBooks                  Excel
Microsoft Word             Access

Experience:
Customer Service Representative,
Acme Commercial Bank, Santa Barbara, CA     2000-present
Received commendation for balancing cash drawer to the penny for the entire 2001 calendar year.

Retail Clerk,
Sav-Mor Pharmacy, Santa Barbara, CA       1999-2000
Rang up customers’ purchases. Handled average sales of $1,500 daily, with payment methods of cash, check, and credit cards. Assisted in office with payroll on occasion.

References:
Available upon request.
**THE COVER LETTER**

Your cover letter should draw the reader in, enticing him or her to read your resume. It needs to be individually created and tailored to include your job objective. This job objective can be the job title, and it tells the interviewer which job you want and are qualified to perform. Check your short skill phrases because you can use these same phrases by adding a pronoun, (like "I") to make complete sentences that describe your capabilities.

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<td>Middle Paragraph: Explain why you are interested in working for this employer and specify your reasons for desiring this type of work. This is the place for you to refer to one or two key accomplishments mentioned in your resume. Be sure to do this in a confident manner and remember that the reader will view your letter as an example of your writing skills.</td>
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<td>Closing Paragraph: Indicate your interest in hearing from the reader, and note what times you can be reached most easily. Tell the reader you will call on a certain date or during a specific week to discuss the possibility of setting up an interview. This shows your motivation and good business initiative. Thank the reader for his/her time and consideration.</td>
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City/State/ZIP Code

Your Phone Number

Date of Letter

Employer's Name, Title

Employer's Department

Company Name

Street Address

City/State/ZIP Code

Dear (Mr. or Ms.) ____________________:

(Tell the reader why you are writing and name the position or department for which you are applying.)

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(Build a connection between your background and the company's needs. Refer to your resume.)

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(Specify when you'll follow up. Express that you will contact them during a certain time frame.)

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Sincerely,

Typed Name

Enclosure
Santa Barbara City College
Career Advancement Center

Open Monday through Friday from 8:00 AM to 4:30 PM and Wednesday from 8:00 AM to 6:30 PM. (No Appointments Necessary)

Our Drop-In Counseling hours are Monday through Friday from 9:00 AM to 4:30 PM and Wednesday from 9:00 AM to 6:30 PM. We are located on the second floor of the Student Services Building in room SS-282.

MonsterTRAK is our on-line job placement service. MonsterTRAK provides fast, easy, on-line listings of local jobs. Check with the Career Center for the current password.

http://www.monstertrak.com

Service Learning allows you to earn academic credit for your volunteer activities in the community. Enroll in PRO 292 (Service Learning). Come to the Career Center for details.

EUREKA is a computerized career information system. EUREKA gives you descriptions of many occupations; tells you how to prepare to go into your field of choice; local and national pay range and the programs available in state, national, and world wide colleges/ universities.

The Major-Minor Finder computer program gives a short quiz that allows you to explore majors which match your interests and academic skills.

The Career Interest Testing Package is a series of interest inventories that identify personal traits, interests and values as they relate to career planning. This is a fee based service.

College Quest is a computerized process to select prospective 4 year colleges and universities for more than 1800 campuses.

The Personal Development Classes are a comprehensive approach to career planning. These courses help you to explore your interests, values, skills and personal traits through assessment inventories, career counseling and class exercises. You also develop job search, resume writing and interviewing skills and techniques. Courses are available both in the classroom and on-line.

Assistance in Resume Writing and Interview Skills is available. Drop by the Career Center to receive these services.

The Career Center Book and Video Library resources include information on the Santa Barbara City College Technical and Vocational Programs, College Catalogs, Career Guides, Magazines and workbooks on Resume Writing, Internet Search and Interviewing.
SBCC Career Advancement Center
Student Employment Job Search
The site for SBCC student job listings is:
www.monstertrak.com

QUICK SEARCH
1) Go to www.monstertrak.com.
2) Click Search Jobs and Internships.
3) Select Santa Barbara City College. Check with the Career Center for the current password, enter it, and then click on search.
4) Click Jobs and Internships.
5) When page appears: change the drop down menu in the keywords section to read “match any of the keywords.” Type in the different cities where you would like to work: Santa Barbara, Goleta, Isla Vista, Montecito, Carpinteria, etc. Click search.

REGISTRATION & RESUME UPLOADING
To e-mail your resume to MonsterTRAK employers, go to www.monstertrak.com and register.
1) Check with the Career Center to get the current password.
2) Click on Post Resume/Register. Select Santa Barbara City College from college career centers.
3) Enter the password and click continue.
   Answer the questions marked by red asterisk (*).
   Complete Education Information page, Employment Preferences, Demographic Information.
   Create login information: user name and password.
   Preview Profile and click Submit.
   IMPORTANT: You must have a completed resume ready to upload into MonsterTRAK.
   You are welcome to come to the Career Center (room SS-282) for assistance and a resume workbook.
4) Click on Resumes.
5) Read and complete the Resume Upload page; give your resume a title. Your resume will be saved in your MonsterTRAK account. You may store up to 10 resumes.
6) Complete the Resume Search Status form and you are finished.
7) You are now ready to submit your resume electronically to MonsterTRAK employers.
   Note: Revisions to your resume must be uploaded too.
Write Your Résumé

Core Sections in the Résumé

Action Verbs

Layout and Format

Working with References

The Electronic Résumé

Workshops and Advising

Sample Reference Page

Sample Résumés

Sample Cover letter

Formulate Your Cover Letter

Counseling and Career Services
University of California
Santa Barbara
CA 93106-7140
(805) 893-4411
www.career.ucsb.edu

Rev. 03.22.04
A résumé is
• a summary of the highlights of your career-related experience
• not a total biography or a complete history
• used by employers as a screening tool

The candidate with the best résumé (not necessarily the best candidate) will often be the one that gets an interview.

Core Sections of the Résumé

CAREER OBJECTIVE.
Includes:
• the title of the job you want to do.
• the level you want to work at (entry, trainee, internship, etc.).
• the setting you want to work in (financial institution, aerospace industry, etc.).
• Example:
Entry level graphic design position for a major magazine.

If you are considering more than one occupation prepare a separate résumé for each. In fact, you may want to prepare an objective for each job to which you apply, using the language of that particular employer.

EXPERIENCE.
Think broadly. Include all experiences that have gained you career related skills: jobs, internships, volunteer work etc. The best experiences are those that relate directly to the position, but any position where you used career related skills will work.

For each entry include:
• position title.
• company name.
• city, state.
• dates of employment.
• skills and accomplishments listed in “staccato” style, using verb phrases (see Action Verbs, next page.)
• Example:
Assistant Manager
ABC Clothing, Santa Barbara, CA Summer, 2004
Managed 3 employees, including shift scheduling. Opened and closed register. Justified daily receipts of up to $1,500. Accrued individual sales of up to $900 per shift. Provided customer service, handled complaints, assisted customers.

Whenever possible list concrete accomplishments (“Improved sales 13% in 6 months”) and use numbers (“Wrote quarterly reports and papers of up to 20 pages.”)

EDUCATION.
List education in reverse chronological order, beginning with your most recent education and working backwards. Include:
• the degree you earned.
• the name of the institution.
• your major or department.
• your date of graduation or class standing.
• your G.P.A. if it is 3.0 or above.
• Example:
B.A., University of California, Santa Barbara, CA

You may also choose to include a subset entitled “Relevant Courses.” List courses that especially qualify you for your career, not overlooking courses that are almost universally appropriate (e.g., writing skills, speaking ability, foreign languages, computer skills, etc.).

SKILLS.
Most résumés now include a skills section for computer and language skills.
• Example:
Hardware: IBM PC, Macintosh.
Applications: Microsoft Office, Internet Explorer, Photoshop.
Languages: Conversational Spanish.

Avoid “soft skills” such as communication skills, organizational skills, detail oriented, punctual, etc. While these are good skills to have, it is almost impossible to prove you have them simply by listing them. “Prove” you have them by talking about how you used them in the verb phrases in your experience section.

REFERENCES.
Simply put “Available upon request.”
Layout and Format

There are 3 basic layouts for resumes: side by side, centered, and hybrid. They are shown below. Employers tend to favor the side by side layout, especially if skills are bulleted in the experience section. However, this layout also uses the most white space, making it a hard layout for résumés with lots of content.
All résumés should
- be aesthetically appealing and easy to read.
- use white space, bullets, bold and caps for eye relief.
- use Times, Palatino, Helvetica or other common fonts. One or two fonts max per document.
- contain no typographical or spelling errors.
- be one page.
- be written in “staccato” style. (“supervised five employees,” not “I supervised five employees.”).
- convey your key qualifications with few words but lots of impact. (Consult the list of action verbs.)
- be written in present or past tense. Avoid “ing.”

WRONG: “I began this position as a hostess. After 6 months I was promoted to waitress. My duties there included serving the customers, totaling their bill, giving them change and making sure my receipts balanced at the end of my shift.”

RIGHT: “Promoted from hostess to waitress in 6 months. Served an average of 25 customers per hour. Balanced cash drawer with daily receipts averaging $200.”

THE FINAL COPY.
- Don’t use a Microsoft Word template. Many of them are quirky and have a strange set up.
- If you want columns on your résumé, use the Table function in Microsoft Word. It works beautifully.
- Use a laser printer if possible to print.
- Be sure you have lots of white space, so your résumé doesn’t look like a sea of gray.
- Use standard-sized (8 1/2 x 11), high-quality bond paper, white, off white, beige or grey - no colors.

Working with References
“References available upon request” means you need to create a reference sheet. First, ask your references if they will speak for you. Then create your reference sheet (see sample on following page). Lastly, keep your references posted on your progress and send thanks. People who help deserve to be appreciated.

The Electronic Résumé
Many companies now ask you to email them your résumé. If you can save your résumé as a PDF, then you can attach it to an email and be sure the reader will see it the same way your do. If you send a word document, it almost always is viewable by the employer as well. However, in the event it is not, you should make a copy of your résumé that uses no formatting - no tables, lines, bold, underline, bullets - nothing but just plain text - and include it in the bottom of your email cover letter.

If you are dropping your résumé into a résumé database, do not include any identifying information except your name and email address. This is to ensure your personal safety. There are a myriad of résumé databank services to choose from. The Electronic Job Search Revolution by Joyce Lain Kennedy and Thomas Morrow [F.36 in our Career Resources Room], includes a listing of these services.

If you decide to try this option, there are a few points to consider. Each databank service has a different way of doing business. However most services sort the information on your résumé into categories such as position sought, industry, work history, occupational skills, education, salary expectation, years of experience, geographical preferences, and willingness to relocate. It is these mini-profiles that the computers use to identify candidates for positions posted by employers. You need to be able to anticipate at least somewhat the keywords an industry might choose and be sure those words are on your résumé.

Workshops and Advising
Résumé workshops are held frequently at Counseling and Career Services. Refer to the workshop calendar printed each quarter for dates and times. After you complete a draft, consult a Career Counselor at drop in hours M-F, 10-4, to discuss your résumé and get suggestions for revisions.
Examples

The sample résumés in this handout are to be used only as suggested formats or starting points only. There are many sample résumé books in the CRR library. It would be a good investment of time to spend an hour looking over the various formats and find one that you think will work best for you.

Sample Reference Page

JONATHAN MILLS
123 Country Road
Goleta, CA (805) 123-4567
jmills00@umail.uscb.edu

REFERENCE SHEET

Jane Cooper, Manager
Visiontek, Inc.
3 Alamito Way, Santa Ynez, CA 93145
(905) 987-6543

• Ms. Cooper was my immediate supervisor during a six-month internship in the manufacturing department at VisionTek. She can be reached during normal business hours.

Tu Riker, President
Goleta Water Council
300 Brook Street, Goleta, CA 93117
(805) 111-2222

• Mr. Riker supervised my work as a public-opinion researcher during the 1998 Pacific storms. He can be reached after 3:00 p.m., Monday through Thursday.

Dr. Felicia Cortez, Director
Marine Scientists for Conservation
390 Walrus Road, Seattle WA 94329
(206) 999-8888

• I worked for Dr. Cortez for three summers. She supervised my conservation projects as well as clerical work. She can best be reached mornings at the number provided.

APPLICANT 1
8720 El Colegio Rd., #106, Iula Vista, CA 93117. (805) 562-6720. student@aol.com

OBJECTIVE
Entry level advertising position in account services utilizing sales and creative abilities.

EDUCATION
B.A. University of California, Santa Barbara.
• Major: English. GPA: 3.0
• December 2003.

EXPERIENCE
Advertising Intern - ABC Advertisers, Santa Barbara, CA. 9004 to Present.
• Designed flyers, brochures, logos, and related materials.
• Collaborated with clients to redesign material using an original format.
• Customized a working invoice and ledger system in accordance with specific company criteria.

Sales Representative - University Directories, Los Angeles, CA. Summer 2003.
• Received comprehensive training in sales and advertising.
• Prepared and delivered presentations to business owners.
• Created ads for my clients and for those of my colleagues.
• Organized and implemented my own business plan.
• Achieved "Top Salesperson" for Los Angeles area.

Chairperson/Public Relations Officer - Latino Business Association, University of California, Santa Barbara, CA. 9002 to 603.
• Created logo and letterhead.
• Scheduled speakers and companies for tours and conferences.
• Actively involved in club projects including advertising, fund-raisers.
• Provided leadership and motivation to 25 members.
• Organized and led meetings, encouraged participation, oversaw all aspects of club activities.

Career Peer - Counseling and Career Services, University of California, Santa Barbara, CA. 9002 to 603.
• Assessed students' needs and assisted them in career development.
• Created and designed promotional flyers and posters.
• Developed effective teamwork skills through weekly meetings and special projects.

SPECIAL SKILLS

• Hardware familiarity: IBM PCs and Macintosh.
• Application competencies: PageMaker, MS Word, Excel, Aldus.
• Languages: Read and speak Spanish.

REFERENCES
Available upon request.
Applicant II

2761 Sandy Beach Drive
Goleta, California 93117
(805) 968-8835
student@email.ucsb.edu

OBJECTIVE
Entry level position in systems programming and development in manufacturing environment.

EDUCATION

Related Courses:
- Software Architecture
- Informal Structures
- Formal and Programming Languages
- Digital System Arithmetic
- Translation of Programming Languages

Digital System Design
Switching Theory
Computer Architecture
Analog Computation
Operating Systems


EXPERIENCE


COMPUTER SKILLS
Languages: FORTRAN, BASIC, PL/I, COBOL, and IBM Assembler.

HONORS & ACTIVITIES
- Twice on Dean’s List of Scholastic Excellence.
- Member and officer of the Society for Women Engineers.
- Member of the Institute of Electronic and Electrical Engineering.
- UCSB Communications Board.
- Design computer games for personal computers.
- Sailing, tennis, and bicycling.

REFERENCES
Available Upon Request.

Applicant III

611 Pedall Way
Summerland, CA 93111
(805) 692-1234
E-mail: applicant@mcl.mcl.ucsb.edu

OBJECTIVE
An entry level position in biological research requiring lab experience, quantitative skills and familiarity with marine resources management.

EDUCATION
B.A., Biological Sciences. University of California, Santa Barbara. June 2005
Relevant Course Work:
- Biology and Systematics of Fishes
- Physical & Chemical Oceanography
- Biostatistics (with use of computer)
- Genetics, Ecology, Communications
- Taxonomy: Marine Invertebrates
- Aquatic Environments
- Comp. Vertebrate Anatomy
- Biochemistry

SPECIAL SKILLS
Laboratory Techniques:
- Mammalian cell structure
- Sterile and staining
- Quantitative extraction, isolation, and determination of proteins
- Water analysis for bacterial counts, bacterial isolation and cultivation
- Plankton cultivation
- Gas chromatographic analysis
- Venipuncture, Coulter counter
- Spectroscopy - ir, ur
- Oxygen determination of respiring algae

Equipment Proficiencies:
- Spectrophotometer, Ph meter,
- Cell counting chambers
- Underwater photographic equipment
- Van Dorn bottle
- Sonicator, Autoclave
- SCUBA diver (Certified, 2001)

EXPERIENCE
Guide. Sierra Club. Santa Barbara, CA. Summer, 2004
Led marine life exploration trips to the Santa Barbara Channel Islands. Organized and presented information. Ensured safety of participants on the trips.

Medicated and maintained chemical balance within holding tanks for 400 species of tropical fish. Inventoried and placed fish entering from all over the world. Shipped fish to resale fisheries.

References Available Upon Request
APPLICANT IV
333 Vera Cruz Circle
Goleta, CA 93117
(805) 216-4432

OBJECTIVE
Internship in accounting.

EDUCATION
B.A., Economics with Accounting Emphasis.
University of California at Santa Barbara.
Expected date of graduation: March 2005

Applicable Coursework:
Accounting Principles and Practices
Financial Accounting
Management of Information
Statistics with Economics and Business Applications

MEMBERSHIPS
Accounting Student Association: member, one year.
Dean's List: two years

COMPUTER SKILLS
Hardware: Macintosh, IBM PC
Software: Microsoft Excel, Lotus 1,2,3 and Word

EXPERIENCE
Prepared bills of lading for computer input. Proofread output.
Performed basic secretarial and office receptionist duties.

Receptionist. YWCA, San Francisco, CA.
Presented recreational and educational programs to prospective members.
Prepared written material for distribution using color Xerox and Fax equipment.

Other Positions: Have also worked as a waitress, library assistant, and retail sales clerk to finance educational expenses.

COMMUNITY INVOLVEMENT
Special Olympics Student Event Coordinator, Associated Students Community Affairs Board. Recruited and trained team of 8 volunteers. Helped coordinate promotional activities leading up to event for over 200 developmentally disabled participants.

Active Volunteer for St. Anthony's Children's Center two years.

REFERENCES
Available upon request.

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APPLICANT V
1234 El Colegio Road
Isla Vista, CA 93107
(805) 968-1234

E-mail address: student@mcl.mcl.ucsb.edu

OBJECTIVE
An entry level position in human resources.

EDUCATION
B.A. University of California, Santa Barbara. Major: Sociology. G.P.A.: 3.2
Expected date of graduation: June, 2005.


PROFESSIONAL SKILLS
Counseling and Interviewing
• Provided assessment and intermediate crisis counseling for students.
• Effectively facilitated problem solving sessions between roommates.
• Interviewed and selected new staff members as part of selection committee.
• Fostered self-esteem and athletic development for Special Olympic athlete.
• Advised students on a wide range of issues and concerns.

Administrative
• Administered a $2,000 budget for residential hall serving fifty students.
• Accurately prepared forms including: equipment requisition, disciplinary actions, damage reports, budget requests.
• Supervised 50 students in the residence halls.
• Scheduled 15 softball games per quarter, including equipment and field arrangements.
• Coordinated $8,000 fund raising efforts for Special Olympics.

EMPLOYMENT HISTORY
Resident Assistant. San Rafael Residence Hall, UCSB, Santa Barbara, CA. 9/03 to 6/04
Cashier. Mike's Pizza. Isla Vista, CA. 6/03 to 9/03.
Sales Associate. Sam's Sportswear. Santa Barbara, Ca. 12/02 to 6/03.

ACTIVITIES AND AWARDS
Dean's List Scholars Award, 3 quarters.
Captain, Intramural Softball Team.
Member, Student Sociological Association of America.
Member, Student Chapter of the Santa Barbara Human Resources Association.
Coach, Special Olympics.

REFERENCES
Available upon request.
Sample Cover Letter

1234 Road Street
Santa Barbara, CA 93101
April 15, 2005

Maya Employer
Human Resources Department
Best Company
7890 Street Avenue
Somewhere, CA 11111

Dear Ms. Employer,

I am graduating from the University of California at Santa Barbara with a B.A. in Sociology and would like to put my education to work at Best Company. I read in the Somewhere Times that you are taking a new twist in your company and are actively working to improve the benefits package you offer your staff. I am particularly interested in the benefits area of Human Resources and would like to contribute to this new project.

As you will see on my résumé, I have taken a number of courses that gave me a good foundation in writing, math, and interpersonal communication. My grades are a good indication that I complete tasks with excellent attention to detail and consistent follow through. In addition to my academic foundation, I interned during fall quarter with the Human Resources Department of the Good Company. This experience provided me with a solid exposure to basic benefits management. I am confident that those basics will enable me to quickly learn your approach to benefits.

I would like very much to talk with you about the possibility of working for you. I am easiest to reach before 10 a.m. To save you any trouble you might have in reaching me, I will call you in the next week to find out if we can meet and discuss my qualifications. Thank you for your time and consideration.

Sincerely,

Pat Gaucho

Encl.

For more about cover letters, see following page.
Formulate Your Cover Letter

The resume is a concise outline of what you have to offer. The cover letter is the sales pitch that will encourage the reader to look over your outline. It is a chance to show the reader the person beneath the accomplishments, to make a personal connection between the reader and your background.

- Individually write each letter you send.
- Follow a business format.
- Address it to an individual if possible.
- Be sure there are no typographical or spelling errors.

This is your chance to show the reader the quality of your work. Be sure your demonstration shows you at your best.

WHAT MAKES A LETTER SUCCESSFUL?
- Your opening line is critical, as is the first paragraph. If you have that mutual friend or are answering an ad, say so right off. Immediately mention the traits you want the reader to consider when thinking of you. Or, construct an interesting opening that jumps out and makes a point.
  - Example: “I’m the product of a three-generation commitment to engineering: my father through aerospace, my grandfather through automotive. Now it’s my turn. Just graduating from college, I’m eager to get my career rolling with a company like National Widget.”

- In the second paragraph, demonstrate your knowledge of the company’s services and products. Show how your specific interests, traits and education make you a perfect fit. This is the heart of your letter. Make your statements short and to the point.

- In the last paragraph, explain how the employer can reach you. Tell the reader when you will contact him/her to see when the two of you might meet to talk in person. This is not being pushy—it is showing initiative.

- Consider borrowing an idea from successful direct mail writers: use a “P.S.” which achieves high readership and response.

- Example: “P.S. - Jim Smith, whom you’ve recently hired, is a friend of mine. Please feel free to ask him about my qualifications.”

The basic point is to write a letter that would persuade the reader that he or she would want to hire you. This is the heart of style.

On the previous page is one of the standard business letter formats. It is not the only one. You may have read books that describe a variety of formats and have already identified a different format as the one you prefer. There is no best format; as long as you keep to one of the standards, you will be fine. The critical component is that it must be letter perfect. Proofread your draft several times and retype it if necessary. Be sure you cover letter, resume and envelope are all the same stationary. Remember, you want to show that your work is not simply O.K., it’s the best it can be.