



Chapter 17 AEROSPACE CAREERS AND TRAINING

Our present day aerospace society is complex and dynamic. It will become more complex as technology advances and the population increases. Aerospace brought about change. The advent of space exploration in 1957, coupled with the beginning of commercial jet aviation in 1958, created an environment where the quest for knowledge became one of our nation's greatest industries. Suddenly, it was not only acceptable, but actually popular to do research.

This brought about what many have called the "knowledge revolution." The computer was developed and refined, enabling people to store and analyze the tremendous amount of data created by aerospace-related industries. During the first decade of the space exploration program, more new knowledge was created than in the entire past history of mankind.

This quest for knowledge placed a great demand on our educational community. We needed, and still need, well-trained people to work in our aerospace community. The highly technical nature of aerospace itself demands training beyond the high school level. The special aptitudes and skills students possess and the courses they take in high school, technical schools and college are important considerations in preparing themselves for an aerospace career.

The term aerospace is often misunderstood. Some think it is an area where spacecraft orbit. Aerospace is actually a compression of aeronautics (the science of flight within Earth's atmosphere) and space flight (the movement of a vehicle beyond the atmosphere). Aerospace embraces the full spectrum of flight, and the aerospace industry that manufactures the components and equipment for things that fly.

***Aerospace** comprises the atmosphere of Earth and surrounding space. Typically the term is used to refer to the **Aerospace industry**, which researches, designs, manufactures, operates, and maintains vehicles moving through air and space. The aerospace field is diverse, with a multitude of commercial, industrial, and military applications.*



Objectives

OBJECTIVES:

Explain how the aerospace age has affected education and training.

Describe the relationship between aptitudes and careers.

List several reasons why junior colleges are popular and serve the educational needs of many people.

Describe the type of training available at technical/vocational schools.

Describe how institutes differ from junior colleges and technical/vocational schools.

Describe the types of aerospace courses taught in 4-year colleges and universities.

Compare the type of education received in a 4-year college with that received in a junior college, a vocational/technical school or an institute.

List four ways that the Air Force helps to train and educate their personnel.

Describe the AFROTC program.

Discuss the Air Force Academy's role in preparing officers for the US Air Force.

State what service the Community College of the Air Force provides to Air Force personnel.



Aptitudes and Aerospace Careers

The special talents and natural abilities that a person possesses are called aptitudes. The figure on page 364 shows some of these aptitudes, i.e., mechanical, verbal, numerical, social and artistic. People with a good mechanical aptitude find it easy to repair, adjust or assemble machinery. Verbal aptitude is important in jobs related to any form of communication, such as reading, writing and speaking.

Numerical aptitude makes mathematics very easy and is important to people seeking employment using calculators or computers.

There is a definite relationship between aptitudes and a person's success in certain occupations.

People working in professions related to their aptitudes are usually happier in their careers. The figure on the next page shows the relationship between various aptitudes and those aerospace occupations in which they are important.

The aerospace industries and government agencies employ aerospace personnel in many thousands of different job categories.



Air Force Pilots

Aptitudes in the areas listed in the chart may lead to satisfaction and success in hundreds of additional aerospace jobs requiring similar abilities. Frequently, there are relationships between aptitudes and the school subjects you may like or dislike, those that are difficult, and those in which you may excel. The chart on the next page shows the association of selected school subjects with representative aerospace occupations in which they have primary importance.

An occupation should provide much more than a means of making a living. It should be interesting, pleasant and provide satisfaction and self-respect in addition to financial rewards. The choice of a particular occupation requires complex decisions involving such factors as general ability, special aptitudes, health, learned skills and family status, as well as the opportunities for necessary education and employment.

You may wonder how your aptitudes compare with those necessary in particular aerospace jobs. You are probably interested in discovering how your personal traits can be used to the best advantage. Questions may also arise concerning the educational requirements for different vocations. Answers to these and many other questions about selecting the best vocation may be obtained in part from persons in your community. With the aid of standard inventory blanks, aptitude scales, interest surveys, and other materials for the measurement of personal traits, your teacher, principal or school counselor may give you objective information about your interests, personal aptitudes and general ability.

Vocational guidance services listed in your telephone directory and operated in your community as nonprofit organizations provide excellent assistance of this type. Local offices of your state employment commission offer vocational counseling services in addition to current occupational information.



APTITUDES AND AEROSPACE CAREERS

Aptitudes	Related Vocational Activities	Selected Aerospace Age Careers
Mechanical	Equipment Development Aircraft Maintenance Machinery Repair	Aeromechanical Engineer Astronautical Engineer Production Technician Power Plant Mechanic Instrument Repairman
Verbal	Speaking and Writing Giving Instructions Persuasive Activities	Flight Instructor Public Relations Director Air Traffic Controller Military Information Specialist Airline Sales Representative
Scientific	Research and Invention Experimentation Scientific Investigation	Aeronautical Engineer Physical Chemist Research Metallurgist Astrophysicist Aeromedical Lab Technician
Manipulative	Equipment Operation Machinery Control Instrument Supervision	Aircraft Pilot Flight Engineer Radar Specialist Machine Tool Operator Production Expediter
Numerical	Mathematical Calculations Arithmetic Reasoning Computational Activities	Data Processing Engineer Aircraft Navigator Research Mathematician Industrial Accountant Airline Statistician
Administrative	Managerial Activities Supervisory Responsibility Secretarial Duties	Research Project Director Management Engineer Airport Operator Military Administrative Officer Stenographer
Social	Service, Advice and Assistance to Individuals and Groups	Aviation Psychologist Personnel Manager Flight Nurse Training Director
Artistic	Self-expression Through Design Drawing and Other Creative Skills	Design Engineer Airline Architect Photographic Technician Technical Illustrator Scale Model Builder



Aerospace Careers and Training

Professional, vocational, educational counselors and private employment agencies operated in your community as business enterprises provide similar assistance. Persons entering the military receive extensive counseling and guidance to help with their proper assignments. Regardless of the choice you make as to the career you want to enter, you will need to receive additional education and training.

Let's look at some of the advanced training available for persons interested in aerospace. In order to keep the U.S. as the world leader in aerospace technology development and manufacturing, we need the best engineers, scientists and technicians possible. If you're interested in mathematics, flight, engineering, science, physics or electronics, you might just be a perfect candidate for a high-flying career in aerospace.



This could be your "office" in your future! Boeing 777 cockpit (Boeing photo)

The first step toward exploring the cutting-edge aerospace industry is simple, and the best starting point or source for universities and colleges with aerospace programs, Technical schools, military service, scholarships, internships, and job opportunities is right here. A degree is not as important as the needed training, on the job training, or hands on experience. All of these go together to equip you with what is needed to get the job you want in the aerospace career fields.

You need to know what you are interested in, hence the "know thyself" rule. What do you have an aptitude for and what do you personally have an interest in? The table above should help you in answering this question. You can get to your goal via a degree, or technical training and several years of experience. Both approaches will get you the job you seek in the future. If you cannot afford college enlist in the military and let them train you at any number of really good service technical schools. This is the equivalent of community college training for free. You will graduate from a service technical training school and spend two to four years mastering your skills through on-the-job-training and eventually training others yourself. When you exit the service or are discharged you will have your Associate of Arts degree finished (or nearly completed), certificates of training in a technical field as well as several years experience. All of this plus the military security clearance you will have been granted while serving in the military make you very competitive in the aerospace job market.

You are reading this because you have an interest in aerospace and have many questions you would



like answered such as:

What sort of skills do you need for a job in the aerospace industry? The skills vary according to the position you are seeking, but generally a vocational degree or higher are required. Being comfortable with computer technology is a must.

Do aerospace jobs pay well? Yes they do. Because of the high technology nature of the industry, aerospace jobs pay 50 percent greater than other manufacturing sectors.

What courses should I take in high school to prepare for a career in aerospace? A well-rounded education is desirable with an emphasis on math, science and computer technology. Heading for vocational school or off to college will determine what courses you should take. Check with your guidance counselor.

How important is education to getting a job in a good engineering firm? Education is very important, particularly in the aerospace industry where peoples' lives depend on the products you develop. An aerospace engineering degree can equip you for many different positions in design, testing, verification, project management or even sales. Complex products require knowledgeable people in many different roles.

Let us survey some aerospace jobs and see what they are, or do. It starts with school and some basic learning like you are doing right now. One needs to enjoy aviation, space related activities, or geography. One needs to be "curious" and enjoy solving problems. To work in an aerospace career field, one does not need an aerospace college degree, but it helps open doors. A person needs a certain level of math and science understanding to work in space related operations. A college degree is the normal entry requirement, as well as a very clean police record for the required higher security clearances.

If you are working with satellites or the information they are handling (imagery, communications, etc.) you must have a security clearance. A record of drug usage, drinking, financial problems, and excessive speeding tickets will end your career even before you begin it.

Community Colleges

The community colleges, or junior colleges as they are also called, have become very popular in recent years and more are being built every year. Why the popularity? The community colleges are dispersed within the various states to make them more accessible to prospective students; students that can live at home and commute to school. Therefore, they are less costly. Also, the community college attendee is more likely to find a job to pay for, or help pay for, education at this level. This happens because they earn an Associate of Arts Degree (AA). An Associate of Arts Degree is a college degree awarded after the completion of about 20 classes. It either prepares students for a career following graduation or allows them to transfer into a Bachelor's Degree program.

Community colleges offer the same courses that students take during the first 2 years at a 4-year college and, at most of them, students can specialize. For example, many provide a 2-year education that is especially tailored to the future engineer (aeronautical or otherwise) or to the future physician. Credits earned in this manner are transferred to a 4-year college or university, and the student proceeds to earn his or her Bachelor's Degree.

In addition to the basic preparatory courses of study, which are common to further study in engi-



neering, medicine, business, etc., the community colleges offer special terminal courses. These terminal courses will vary from college to college because they are usually established to fulfill the needs of prospective employers (industries) found within a local, state or regional area. As a result of the growth of new technologies created by aerospace developments, more and more community colleges offer courses that prepare students for vocations in the aerospace industry (air transport and aerospace manufacturing) and related fields (government and military).

Common to most of the community colleges will be a continuation of studies in language, mathematics, history and certain other subjects that were begun in secondary school. In any event, the amount of exposure to these basic subjects will depend on which of the curricula a student chooses.

Compared with workers whose highest level of educational attainment was a high school diploma, workers with an Associate Degree averaged an extra \$128 a week in 2001, according to the Bureau of Labor Statistics (BLS). People with Associate Degrees also are more likely to find jobs: the unemployment rate in 2001 was more than 30 percent lower for Associate Degree holders compared with high school graduates. And, according to several academic studies, advantages in the job market might be even greater for those just starting their careers and for those who work in a career related to their degree.

Technical & Vocational Schools

Curricula designed to prepare students for studies beyond community college level place more emphasis on basic subjects. On the other hand, curricula that are highly specialized and terminal (non-degree) place more emphasis on the subjects students will study. These schools prepare you to take an examination to obtain a required certificate for employment.

Technical/vocational schools provide the majority of the formal technical educational courses. In this type of school, many people learn the special trades and skills that are applicable to the aerospace industry. A person planning to become an aircraft welder, an electronics technician or an aircraft power plant mechanic should seek the nearest technical/vocational school and obtain details on what the school has to offer. Let's take a quick look at what you would study if you were to decide to specialize as an aircraft airframe and power plant mechanic:

Aircraft basic science	Rocket engines
Covering and finishing	Aircraft power plants (introduction)
Aircraft sheet metal	Power-plant installation and test
Assembly and rigging	Induction, fuel and oil systems
Aircraft wood work	Repair stations (organization, management and operation)
Auxiliary systems	Aircraft propellers
Aircraft welding	Aircraft hydraulics and pneumatics
Radio, electricity and instruments	Turbine engines (operation, maintenance overhaul)
Aircraft electricity	

How long does it take to complete one of the courses of study described above? Like Community Colleges, it takes about 2 years. This time can be shortened to perhaps 15 calendar months if the student



continues studies without a vacation break. Examples of aviation maintenance programs or Courses:

Associate of Occupational Science in Aviation Maintenance Technology is designed to not only provide you with the proper knowledge and skill levels to excel in aircraft maintenance but you will earn a AA degree. That degree may lead to job advancement in the future. This training provides you with the proper knowledge and skill levels required to pass the A&P license tests administered by the Federal Aviation Administration (FAA).

Aviation Maintenance Technician (AMT) Programs are designed to provide students with the proper knowledge and skill levels to excel in their chosen career field as an AMT or as a aircraft service technician. This training prepares students with the knowledge and skill required to pass the A&P exam administered by the FAA to gain entry level employment in aviation and other maintenance fields as inspectors, installers, parts managers, and equipment or service technicians.

Aviation Maintenance Technical Engineer (AMTE) Programs prepare students for the airframe and powerplant FAA license exams and additionally the avionics program for the FCC licensing exam.

Airframe Maintenance Technician Programs are designed for a person who desires to work with airframes and other similar structures. Tasks may include performing assembly, repair, rigging and inspections on a variety of control systems. This training can prepare a person for entry level employment in aviation maintenance, or in service technician positions throughout the world.

People who graduate from this type of school go directly into the work force of private industry or government. Usually there is a short period of further training sponsored by the employer. This is necessary because no two companies use the exact same manufacturing or work procedures and the new employee's skills must be adjusted to the employer's methods of doing things.



Welding is utilized in many construction and manufacturing businesses.

Institutes

Institutes like the technical/vocational schools and community colleges (terminal courses), place more emphasis on subjects that are essential to doing the job for which the student is preparing. However, there will be several courses in the humanities (rather than subjects in science) that will help give the student a well-rounded education. Also, unlike community colleges and technical schools, students enrolled in institutes will earn a Bachelor of Science (BS) degree.

Students attending an institute may concentrate in aerospace engineering, electronic engineering, mechanical engineering, aeronautical engineering, and aircraft maintenance engineering technology, aviation management and mathematics. Aerospace engineering is a curriculum that has evolved because of space developments. This type of engineering education prepares a person to work on either aircraft or spacecraft design and production programs—hence the title “aerospace.” Listed on the below are the subjects to be mastered over a 4-year period by the aspiring aerospace engineer.

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Engineering education prepares a person to work in many areas of the aerospace field.



Freshman and Sophomore Years:

- English composition and literature
- Economics
- US History
- Oral communication
- Political science
- Technical report writing
- Chemistry
- Electronic engineering—introduction
- Engineering: orientation, drafting
- Engineering mechanics: dynamics, statics
- Mathematics: calculus, analytic geometry, computer programming, advanced engineering mathematics
- Mechanical engineering: engineering materials and design
- Physics: mechanics, thermodynamics and electrostatics, atomic physics and quantum mechanics

Junior and Senior Years:

- Aerospace engineering: guidance and control systems
- Electronic engineering: electrical network analysis, electronic circuits, linear systems analysis
- Engineering: engineering design, engineering economy, systems engineering
- Engineering mechanics: strength of materials, fluid mechanics, aircraft structures
- Mathematics: complex variables, probability and statistics
- Mechanical engineering: thermodynamics, engineering metallurgy, heat transfer



The curriculum shown above is an example taken from one institute. A comparable curriculum for the aerospace engineering degree may be slightly different at other institutes. Language studies in composition, technical report writing and oral communication prepare the aerospace engineer to communicate with fellow engineers and the public. Of course, the several courses in mathematics are essential to physics and engineering studies.

Aerospace Schools and Flight Training

The aviation industry is a multifaceted, dynamic career field that involves the interaction with, management of, and operation of aircraft. With the extensive career opportunities that exist within the aviation industry, there are many undergraduate programs for students to choose from. Regardless of whether a student majors in commercial aviation, aviation management or air traffic control their degree program will include studies that involve aviation safety, aviation law, and business management as well as aircraft operations. In addition to seeking a job position flying for an airline or corporate flight department, you can obtain employment in areas such as managing an airport, air traffic control, working in aviation for many government agencies or operating aviation related businesses.

What Kinds of Students Major in Aviation / Flight Training? Many Aviation careers require at least a bachelor degree in aviation science, civil aviation or a related field, with courses in aerodynamics, aircraft systems, navigation, human factors, aviation management, aviation law, air transportation and aviation safety.

Is Aviation / Flight Training the right major for you? Take the MyMajors Quiz and find out if it is one of your top recommended majors: <http://www.mymajors.com/college-major-quiz.cfml>

What Courses Do Aviation / Flight Training Majors Take? The required and elective courses you would take for Aviation/Flight Training majors vary considerably among institutions. Courses are listed here that are illustrative of the breadth of topics you are likely to experience were you to major in this field:

- Advanced Aircraft Systems
- Air Traffic Control
- Airport Operations
- Aviation Safety
- Flight Physiology
- Aeronautics
- Air Transportation
- Aviation Law
- Business Management

Four-year Colleges/Universities

Entry into a college or university is recommended for those who intend to earn a degree, and either do or do not know how they will use their education. The college or university offers a much broader education to its students than they can get in a junior college, a vocational/technical school or an institute because they can choose from more electives in both humanities and science areas. The person who wants to specialize immediately upon beginning the freshman year can do so in somewhat the same manner as in the institute, but they will have to take more courses in humanities. Aspiring engineers, for example, begin introductory engineering courses as freshmen. For the person who hasn't decided on a specialized

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course of study when entering a college or university, the final decision on the area of major study can be postponed until the beginning of the sophomore or junior year. There is only one drawback to this approach for those who decide on an engineering major. It will take additional study to complete the engineering requirements if the prerequisite subjects were not taken during the first 1 or 2 years. This means that if one doesn't plan ahead, the total time involved for the basic

engineering degree could be as long as 6 years.

Curricula vary in colleges and universities. This is particularly true with the elective courses. Today's forward-looking educators have taken steps to help students understand the aerospace world and the changes brought about by aerospace developments. Many colleges and universities now offer courses especially tailored for this purpose. Some colleges provide flight training as an elective for the entire student body and as a required course for certain major fields of study.

Several universities developed curricula which are especially designed for aerospace careers. These particular institutions now afford an aerospace minor for students who are majoring in some other subject. They also provide a special 2-year program for students who want to become professional pilots, but also want to expand their education beyond what is needed to master the art of powered flight. The institution also gives credit for pilot certificates earned. In addition to these special courses, a person can receive a bachelor of science degree in either aerospace administration or aerospace technology, and a master of education degree in aerospace education.

The curriculum for aerospace technology was designed for students who intend to become professional pilots or who want to work within the various technical fields found in the aerospace industry. It contains a mixture of courses from engineering and other curricula.

Of particular interest is the curriculum for the degree in aerospace administration because it is relatively new and was designed to prepare a person for an administrative or managerial position in the aerospace field. Let's see what kinds of courses are given in this curriculum:

Freshman Year:

Theory of flight
FAA regulations
English composition
College algebra

Plane trigonometry
Science
Technical drawing
General metals



Sophomore Year:

Meteorology
Science
Navigation
American people

Flight instruction
History
Prose fiction
General psychology

Junior Year:

Propulsion fundamentals
Aircraft operation & performance
Principles of economics
Statistical methods
Basic electrical fundamentals (plus electives)

Alternating current theory
Principles of accounting
Principles of management
Data processing

Senior Year:

Aerospace vehicle systems
Aerospace internship
Management

(plus a certain number of electives and the courses needed to complete the requirement for a minor.)

Note that this curriculum gives the student a very broad but in-depth sampling of courses that pertain to specialized areas in the aerospace field. At the same time, it provides a good background in those subjects that a person needs to know to become an administrator or manager.

Military Technical Training Schools

The serious, determined student will find it possible to get the education wanted and needed from civilian schools. If funds are low or nonexistent, the student can work while going to school, borrow the needed funds (to be repaid after graduation), win scholarships, obtain federal assistance or enter a co-op plan with an industry (student alternates full-time work periods with full-time school periods).

Training plays a key role in all of America's Military branches. Whether you're joining right out of high school or after earning a college degree, you'll have the opportunity to advance yourself at all stages of your career. The Air Force alone conducts nearly 4,000 technical training courses. Through any of a variety of training centers and training programs, depending on your position in the military, your training will be hands-on. Your trainers: the most knowledgeable around, with real-world experience. Your equipment: beyond cutting edge.

No matter what you do or where you go, you'll get the best training around. Each branch of service uses the best schools to train its personnel. If you choose the Marines or Air Force, do not be surprised if you go to a technical training school that is run by the Navy, and vice versa. In fact, the Navy has





been recognized as one of the world's top training organizations by Training magazine. The magazine's list evaluated demonstrable results, innovation, success factors, training strategic goals and objectives.

Training Centers that Reflect the Mission

If you enlist, your first training will take place at a basic training facility, unique to your branch of the service. While it's called boot camp, it's really a huge campus that includes both classroom and lots of hands-on training, and learning to become a member of your branch of the service. When you graduate from "boot camp" or "basic training" you will move on to your specialty, MOS, or AFSC training. This training is from a few weeks to over a year in length depending on the "job" you have signed up for. No matter what the training, when you finish it, you will be at an apprentice or journeyman level, have one or more certificates and be ready for more on-the-job training and gaining experience in your trade or specialty.

Advanced and Specialized Training

Through extensive classes and on-the-job training, you will have learned the fundamentals of your chosen technical field. There are numerous opportunities to take on advanced training courses, and they are recommended once you have the basic fundamentals of your job mastered, and have satisfied a minimum time-in-the-job requirement. You could even earn an Associate's or Bachelor's degree. For a list of all training available, you can consult the Catalog of Navy Training Courses (CANTRAC), or if you are in the Air Force, the Base Education Center will assist you via the Community College of the Air Force.

Community College of the Air Force

When you join the United States Air Force, you're automatically enrolled in the Community College of the Air Force. It's not only America's largest community college, but it's also the only degree-granting institution in the world dedicated entirely to Air Force personnel. The Community College of the Air Force is also a unique combination of on-duty and voluntary off-duty courses with classes and times that are flexible to meet your needs.

Since 1972, enlisted men and women in the Air Force have had their own community college. The Community College of the Air Force helps airmen and noncommissioned officers by translating what they have learned in Air Force technical training and on-the-job training into college-level semester hours. Air Force enlisted members can then credit those hours toward an Associate of Arts Degree related to their Air Force job.

The Community College of the Air Force is a worldwide multi-campus college. The seven major technical schools, the professional military education system and the field training detachments are affiliated with the Community College of the Air Force. Enrollment in the college is voluntary, but many enlisted people enroll because they know that planning for the future includes the need to document the technical education they receive in the Air Force. You'll work toward your Associate of Arts Degree in applied science in one of five career areas — aircraft and missile maintenance, electronics and telecommunications, allied health, logistics and resources or public and support services. You'll be earning college credit just for doing your job while gaining invaluable experience to help your career take off.

When an enlisted person enrolls in the Community College of the Air Force, he or she receives





a transcript with the credits granted for Air Force courses completed. For example, by completing Basic Military Training (BMT) airmen earn 4 semester hours of Physical Education. The Community College of the Air Force maintains a computerized record of each student's educational progress. This record will automatically pick up all applicable Air Force courses and translate them into semester hours and into civilian educational terminology. Students are able to add civilian courses, which may then be applied toward an Associate of Arts Degree.

Degree programs include a minimum of 64 semester hours of Air Force and civilian instruction including:

- 24 semester hours in technical education directly related to the student's Air Force career area.
- 21 semester hours in the area of general education (courses include humanities, math, natural sciences, physical education and communication skills) and 6 semester hours in management education.



Pararescue Trainees

The remaining hours are technical or general education hours and are usually elective options. The Community College of the Air Force offers Associate of Arts Degrees in more than 70 programs. Some are in career areas such as aircraft and missile maintenance, electronic and telecommunications, health care sciences, management and logistics and public and support services.

When a Community College of the Air Force student leaves the Air Force, he or she can take the transcript or can write for one later. It's a document easily understood by potential employers, trade unions and college officials. The transcript is valuable whether or not the individual completes an Associate of Arts Degree.

Air Force Reserve Officer Training Corps

The Air Force Reserve Officer Training Corps (AFROTC) is the primary source of commissioned officers for the Air Force. The program is offered on the campuses of most colleges and universities.

Two commissioning programs are available through AFROTC for college students. Freshmen may enroll in the 4-year program, and students with at least 2 years of undergraduate or graduate work remaining may apply for the 2-year program. The two programs are open to both men and women.





**ROTC
Cadets**



Both 4-year and 2-year cadets attend the Professional Officer Course (the last 2 years of the AFROTC program). The 4-year cadets also take the General Military Course (the first 2 years), which consists of 1 hour each week in

the classroom and 1 hour of leadership laboratory (military training and leadership). Classroom instruction time for the Professional Officer Course is 3 hours weekly, plus 1 hour of leadership laboratory. Four-year cadets must complete a 4-week field training course during the

summer between their sophomore and junior years. Two-year cadets complete a 6-week field training course (which makes up for the General Military Course) before entering the program. Scholarships are available to qualified cadets in both the 4- and the 2-year AFROTC programs.

Each scholarship provides full tuition, laboratory expenses, incidental fees and a reimbursement for textbooks. While all cadets receive a monthly, nontaxable subsistence allowance of \$100 in their junior and senior years, scholarship cadets receive this allowance for the duration of the scholarship.

In either program, there are certain commissioning requirements. The cadet must successfully complete the Professional Officer Course and field training, must earn at least a Baccalaureate Degree, must agree to accept a commission in the United States Air Force if it is offered and must agree to serve for a period of not less than 4 years on active duty after being commissioned.

Pilot candidates must serve several more additional years after completion of pilot training than do non-flying officers. Navigator candidates must also serve several more years after completion of navigator training than non-flying officers.

AFROTC cadets who volunteer and are qualified for Air Force pilot training take their first step toward winning their wings through the Flight Instruction Program (FIP), which is provided at no cost to the cadets. The program is conducted during the 24 months prior to the commissioning. It serves as a test of the cadets' aptitude and interest in flying before attending undergraduate pilot training as an officer. High school students who have successfully completed at least 2 years of the Air Force Junior ROTC program (AFJROTC) may receive credit for a portion of the General Military Course, if they elect to enroll in the 4-year college ROTC program.



The US Air Force Academy

On an 18,800-acre site located near Colorado Springs, Colorado, the Air Force Academy ranks among the nation's finest colleges and universities. Appointees to the Academy receive a 4-year college education in addition to military and physical training. The academic curriculum consists of studies in both the humanities and the sciences. Successful completion of the prescribed courses leads to a Bachelor of Science degree and a commission as a second lieutenant in the Air Force or one of the other armed services.

By authorization of Congress, the Air Force Academy maintains a strength of 4,500 cadets. This equalizes the student strength of the Air Force, Army and Navy academies. US senators and Representatives make most of the yearly appointments to the Air Force Academy. The nominees are selected by members of Congress from eligible young people in their states or districts who have applied for an appointment.

Application for appointment to the academy must normally be made during the year before the applicant wants the appointment—in other words, during their junior year in high school. Of special interest to AFJROTC students is the fact that five students from each high school may be nominated to compete for authorized vacancies in the academy. To be eligible, the student must have successfully completed the AFJROTC program at his or her school and be awarded a Certificate of Completion and a high school diploma. The aerospace education instructor recommends the best-qualified applicants to the high school principal, who in turn, submits the nomination to the academy.



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A prospective appointee, male or female, to the Air Force Academy must meet the following requirements:

- Be at least 17-years-old and not have passed his or her 22nd birthday on July 1 of the year of admission.
- Be a citizen of the United States. (This does not apply to allied students).
- Be of good moral character.
- Be unmarried and have no dependent children. Any cadet who marries while at the Academy will be discharged.
- Be in good physical condition.
- Have a good scholastic record.
- Have demonstrated a potential for leadership in extracurricular activities.
- Have a strong desire to become a cadet and have an interest in serving as an Air Force officer.

A successful candidate for admission must assume certain obligations and sign an agreement to that effect. The candidate must agree to complete the course of instruction unless disenrolled by competent authority. The candidate must accept an appointment as a commissioned officer upon graduation, and serve in one of the armed services for at least 6 years. If authorized to resign before the sixth anniversary of his or her graduation, the candidate must serve as a commissioned officer in the Reserve component of the service until such sixth anniversary is reached. If disenrolled from the Academy, the candidate will be subject to the separation policies employed by all service academies.

The Air Force offers a comprehensive range of academic courses, in addition to leadership and military training, physical education and athletics. Cadets may select their major from numerous courses offered within the fields of science and engineering, or social studies and humanities. The academic program of the Academy includes graduate-level courses, which may be applied toward a Master's Degree under a cooperative arrangement between the academy and various civilian universities in less than 1 year after graduation. Graduate programs include both science and engineering fields, and social sciences and humanities.

In conjunction with the Academy, the Air Force conducts the Air Force Academy Preparatory School. It is for selected members of the regular and reserve components of the Air Force and for unsuccessful candidates for the academy whose records indicate that they could improve their chances of receiving an appointment by additional academic preparation. The preparatory school provides an 11-month course of intensive instruction in English and mathematics to assist students in preparing for the entrance examinations. It also prepares the students for the academic, military and physical training programs of the academy.



You finish Your Education, and Ask, “Is There Life after School?”

After all the work and completing your aerospace education, how do you find the right job for your future? Below is a series of steps that have been proven to work. There is no quick answer or timetable unless your father owns a factory and names you the vice-president. The steps to a career begin while you are in college or in a training school as an intern. Remember that word “intern” is the key. The steps listed below build upon one another and should result in a career you enjoy, in a location you choose and at a salary you are comfortable with. This last sentence is what you are now striving for

In a country with 7 - 8% unemployment statistics, you will have to do something to sharpen your competitive edge to get hired. In the following modules you will be introduced to several successful ways to put the edge in your favor, from writing a cover letter and Resume they will read, out-foxing the computer that “mines” key words out of your Resume, to how to dress and follow up on an interview.

The steps are:

- Internships
- Filling out the application correctly
- Cover letters to the hiring official
- A short and concise Resume
- Knowing where the work is located
- Knowing what the pay is in different locations across the country
- A successful interview

Aerospace Summer Internships

Summer internship jobs exist in most large aerospace corporations, across the country. Job assignments are primarily for college students at the sophomore level and above and are designed to give students the opportunity to work in scientific, technical, or administrative areas of the company. The difficulty and level of responsibility of each job depends on the needs of the project and the career interests and level of experience of the student.

These companies seek students majoring in science and engineering, computer science, mechanical engineering, aerospace engineering, information systems, and mathematics. All majors will be considered. Most companies offer competitive compensation, attractive working conditions and a professional environment. This an incredible way to get yourself in the door and to be considered for employment once you have your degree in hand a few years down the road.

Applications

Every company has a process they follow to hire new employees. Human Resources or HR as they are known has HR representatives go to the same schools to learn their job. You will have to play according to their rules, or read “What Color Is Your Parachute” and work it a little bit differently to get a job in spite of HR. Here is the accepted process at a glance. Generally this process begins with your application. In today’s world applications tend to be on line.

Online Applications

Almost all applicants wanting to be considered for employment must complete an online application. The online application can be accessed through a company’s “Search Jobs button” on the employment



careers or opportunities web page. For most companies, in order to apply to a specific job or submit an online resume, applicants must register by creating a user name and password and entering a valid e-mail address.

Once your application and resume are submitted you can expect an online application to remain in a company's database for 12 months from the date of last activity, which includes updating the Resume and/or applying for a specific job opening.

Once you submit the application the company computer will match words in the company job description against your paperwork. As a rule anything less than a 75% match does not even go to an HR person to look at. Your application was dead on arrival. The secret here is to have done your research first, and worded your application against the job description you are applying for. For this reason alone you must make your Resume and cover letter mirror the job you are looking at.

A Short Concise Resume

A Resume is in simplest terms, a document that presents your abilities and work experience, if you have any, in a systematic way which gives the recruiter or an employer a general detailed overview of you as a prospective employee.

Writing a really great Resume is far from following specific rules and advice you hear from others. Some common notions like the Resume should just be a page long, etc. is very misleading. Every Resume is one-of-a-kind "marketing communication." It should be appropriate to the post applied for. It is about you, not fluff and pretty words and formats. Writing a Resume is something that follows a set pattern. It is a simple presentation of your achievements or strong points in your career, be it educational or professional. The format in which you are supposed to present the information is quite simple and devoid of any decoration.

Resume Importance

The importance lies in making the crucial first impression. If your Resume is well laid out, systematic, precise and to the point you are seen as sorted and organized. It is important because the Resume is what the employer or the recruiter sees, way before any interaction with you in person or on the telephone. Human Resources (HR) has to swim across the sheaf of papers and a pile of Resumes, and an impressive and well formatted resume with relevant highlighted points really stands out.

Resume Purpose and Focus

Your Resume is a tool for winning an opportunity for an interview. It wouldn't be wrong to say that it is also an advertisement of yourself in the job market. Keeping yourself in the employer's shoes is the key point here while answering the question as to what should be the focal point of a Resume. Ask yourself what makes you a perfect candidate for the said job. What does the employer really need and is looking for?

Resume Content

In short, the Resume content has to be convincing to the reader about how good, useful and profitable an employee you can be to them. So the content should invariably revolve around what you you done in the field or industry until now, what were your responsibilities, what were your targets, what was the work profile or nature of job, etc. Be sure to use words like: achieved, delivered, exceeded ex-



expectations, beat goals, acquired, etc. Companies want to see an inventory of achievement and success, not a history of menial tasks. If you are having trouble coming up with solid statements of achievement and results from your previous jobs, that's a problem.

Parts of Resume

Resumes are made up of two generic sections, namely, the first where you mention your qualifications or things that you have achieved so far, and the second the details of all the information you gave and proof for the claims you made for being hired.

Cover Letters

A Resume cover sheet or cover letter is a letter that goes with your Resume to the employer giving details on why you are applying. You need to send a cover sheet with all Resumes, always. Your Resume cover sheet has to be very specific to the company in which you are applying for employment.

Your resume cover page is one of the most critical pieces of your Resume marketing kit. Unfortunately, it is all too often completely overlooked by job seekers.

In the cover sheet, you can specify why you are sending the Resume and what exactly you have which will be useful for the company if it hires you. The cover page provides you with a number of advantages that you cannot hope to achieve with a stand-alone Resume. For example: the standard Resume is limited to one or two pages at a maximum. If your Resume is longer than this, you have already lost the ball game. With such a short amount of space, it can be difficult to broadcast the message that you are the ideal candidate. The cover page, however, allows you the opportunity to go into greater detail about your specific qualifications, skills and experience. It gives you a chance to truly shine. Cover letters are meant to introduce yourself briefly to your potential employer, creating in them a desire to know more about you and to want to meet you in person to discuss job opportunities.

Where the Jobs Are

Jobs in aerospace companies are located virtually everywhere, or in many different locations. Using a good search engine is the quickest way to look over a large area for jobs. The search engine web sites listed below will allow you to search jobs requiring a security clearance to jobs requiring none. The jobs go from entry level positions to masters of their trades. You are only limited by your imagination and time constraints to research the web and find the job you are seeking.

Printed or downloaded lists change daily. For that reason there are none here. Begin with the Job Search wizard sites below, and start your own search:

- www.avjobs.com/salaries-wages-pay/index.asp - updated daily (Job Title, Location, and Salary):
- http://www.salary.com/careers/layouthtmls/crel_narrowbrief_RD01.html

What do different Aerospace Career Fields Pay?

Wages vary from company to company, region to region and even state to state. Wages can even be different within the same company based on location or even seniority (length of employment/ union rules). Alternatively, the amount earned after five (5) years or more is often much different than what you earn in the first year. Use these pages to discover the reality of "First Year Earnings" in the



aviation industry.

The aviation industry offers career opportunities to suit many interests and backgrounds. As aviation remains an integral part of our society, there is still a growing need for qualified personnel. The Avjobs website above menu areas of Aviation Career Salary, Wages and Pay provides this look at salaries, wages and pay in the aviation industry for you as you plan for your future. The following web site is ideal for finding answers to your pay questions:

- <http://www.avjobs.com/salaries-wages-pay/index.asp> - (This web site is updated daily!)

Interviews

Your cover page memo and Resume addressed to the hiring person (not HR), opened the door for the interview. You told them you knew what they are looking for, and you are the right person for that job. It sounds simple, but the interview is the moment you confirm yourself as that person. There are several do's and don'ts that you need to remember and several additional things that separate the professional (you) from the also-ran's.

When asked to describe themselves, far too many job applicants start into a rant that covers their entire life history. What the employer is looking for with this type of question is your experience as related to the available position. They don't care about your childhood or how many kids you may have. They want to know what skills you have that qualify you to work with them and other aspects of your previous experience. Keep the personal details out.

Don't blow off the questions about your weaknesses and strengths. They are bound to come up in almost every interview you go to, so start preparing for them right now! This is a big question where many people destroy their chances of being hired, so it's important to spend some time learning the correct way to answer. Take a sheet of paper and draw a line down the center. Label one column "strengths" and the other "weakness." Take a few minutes to randomly list all of the appropriate characteristics for yourself in each column. Next, go through and cross out anything that is unrelated to employment and the specific position you are applying for. Finally, come up with one word for any words that are extremely similar, narrowing down each list as much as possible.

Even before you land a job interview, you should be learning about the most commonly asked questions and practicing your answers in the mirror at home. This will prepare you to give natural sounding answers in a very calm, natural tone in the interview. View the following web link to a job interview video and good luck: <http://video.about.com/jobsearch/Preparing-for-a-Job-Interview.htm>



Key Terms and Concepts

- aptitude
- curricula
- community colleges
- technical/vocational schools
- institutes
- four-year colleges & universities
- Air Force Reserve Officer Training Corps (AFROTC)
- Flight Instruction Program (FIP)
- Air Force Junior Reserve Officer Training Corps (AFJROTC)
- Air University Professional Military Education Courses
- Air Force Academy
- Air Force Academy Preparatory School
- Community College of the Air Force

? Test Your Knowledge ?

SELECT THE CORRECT ANSWER

1. There (**is / is not**) a correlation between your aptitudes and school subjects you like or dislike, and those that are easy or difficult.
2. (**Universities / Institutes**) offer only those courses and degrees designed for a specific career field.
3. Community colleges and vocational schools both take about (**2 / 4**) years to complete.
4. Technical/vocational schools provide the majority of (**formal technical education courses / associate degrees**).
5. Enrollment in the Community College of the Air Force is (**voluntary / automatic**).
6. After attending a technical school, there is usually a short period of (**adjustment to the working world / further training sponsored by the employer**).



MULTIPLE CHOICE

7. Which is not true of the impact aerospace has had on education and training?
 - a. It actually made it popular to do research.
 - b. Its highly technical nature demands training beyond high school.
 - c. It caused change leading to the so-called knowledge revolution.
 - d. It caused only a temporary need for better-trained people.
8. Which is not a reason for the surge in junior or community college enrollment?
 - a. Limited locations make them less accessible.
 - b. Students can live at home and commute to school.
 - c. They are generally less costly.
 - d. Students can find employment to help pay tuition.
9. Which is not a course likely to be found at a technical/vocational school?
 - a. Aircraft basic science
 - b. Rocket engines
 - c. Science
 - d. Auxiliary systems
10. Which is not true of the Air Force Academy?
 - a. It provides a four-year college education.
 - b. You are commissioned as 2nd Lieutenant upon graduation.
 - c. You must be between 17 and 22 to be admitted.
 - d. The Fighting Falcons always beat Army and Navy teams.
 - e. You must be unmarried and have no dependent children
11. Which of the following is not true of the AFROTC program?
 - a. It has two and four year programs.
 - b. The monthly stipend is only available to the four-year cadets.
 - c. It incurs a four-year commitment to serve on active duty upon completion.
 - d. Both programs require a field-training course.

FILL IN THE BLANKS

12. The special talents and natural abilities that a person possesses are called _____.
13. Selecting an _____ based on your _____ may help you to _____ in it.
14. Aircraft welding is probably a course at a _____.
15. _____ are those designed to fill the needs of local employers and are part of a non-degree program offered at community colleges.
16. _____ is the primary source of commissioned officers.
17. In AFROTC, both 2- and 4-year cadets attend the _____ while the 4-year cadets also attend the _____.



18. The _____ serves as a test of the cadet's aptitude and interest in flying before they attend Specialized Undergraduate Flying Training as an officer.

TRUE OR FALSE _____

19. During the first decade of the space exploration program, more knowledge was created than in the entire past history of the world.
20. Standard inventory blanks, aptitude scales, interest surveys and other materials can be used to determine your interests, special talents and general ability.
21. Junior colleges are declining in popularity because they no longer fill a need in the education of their students.
22. Credits earned at a community college are not transferable to 4-year schools.
23. The Air Force Academy Preparatory School is a mandatory, 11-week course for all in-bound freshmen.

SHORT ANSWER _____

24. What is the relationship between aptitudes and success in certain occupations?
25. Discuss what expectations you should have about an occupation.