

## Undergraduate Programs - II

### Special Approaches To Learning

At Stevens, taking what is learned in the classroom and applying it in a hands-on environment is an integral part of each student's education. Therefore, we offer a variety of opportunities such as cooperative education, internships, research and industry-sponsored projects.

#### COOPERATIVE EDUCATION

Cooperative Education at Stevens is an exciting opportunity for you to expand upon and apply classroom theory in a professional work environment before you graduate. In addition to the advantages of gaining relevant work experience, co-op earnings can help pay for your college education.

In its simplest terms, "co-op" at Stevens is a five-year academic program in which you alternate semesters of full-time study and full-time professional work related to your major and career goals. The first year is spent at Stevens, completing the academic requirements of freshman year and preparing for the professional world of employment. During the following three years, you alternate semesters of increasingly responsible work in industry and study at Stevens. The fifth (senior) year is then spent at Stevens. Co-op employers range from the giant internationals to small consulting firms. While most jobs are in the New York metropolitan area, Stevens students can, and do, co-op outside the region.

Year	Semester	Schedule A*	Schedule B*
1st Year	Fall	Semester 1	Semester 1
	Spring	Semester 2	Semester 2
	Summer		++
2nd Year	Fall	Semester 3	
	Spring		Semester 3
	Summer	Semester 4	
3rd Year	Fall		Semester 4
	Spring	Semester 5	
	Summer		Semester 5
4th Year	Fall	Semester 6	
	Spring		Semester 6
	Summer		
5th Year	Fall	Semester 7	Semester 7
	Spring	Semester 8	Semester 8

	work term
++	open or possible work term

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\* You will be assigned Schedule A or B

#### **Academic Benefits**

- Through hands-on experience you can feel confident about your chosen field of study very early in your college career.
- Since you apply the fundamentals learned in the classroom to solve problems in industrial or business settings, you strengthen your Stevens education.
- You may have access to state-of-the art equipment not available on any college campus.

#### **Financial Benefits**

- Over the course of the entire program, co-op earnings can provide a significant portion of your college expenses. Last year salaries ranged from \$12-19 per hour, or \$450-\$750 per week. Thus, over the three-year work period you can earn up to a total of \$52,000.
- Tuition costs are payable over five years instead of four.
- Upon graduation, you are in an excellent position to be hired quicker and with a higher salary than most students who have no professional work experience.

#### **Professional Benefits**

- Over the course of the entire program, you have the opportunity to work for a maximum of three different companies. In doing so, you can realistically define your career objectives before you graduate.
- You learn how to work with a wide range of personalities and how to become a professional in your field.
- You have the chance to become familiar with a company before accepting a permanent position upon graduation.
- You can develop a network of professional contacts and references that will prove helpful over the course of your entire career.

#### **The Professional Practice Option**

Students who wish to complete their degree in four years have the option of participating in the Professional Practice Program. After the completion of semesters 1 - 4, you may choose to enter the Professional Practice Program and interview on campus for your first professional assignment while taking semester 5 classes over the summer. You will begin your first assignment in the fall semester and return to the same employer the following summer. Semester 6 courses are taken in the spring. The Professional Practice Program will provide you a meaningful work experience and the opportunity to build an impressive resume through two semesters of assignments. This option is available primarily to Computer, Electrical, and Mechanical Engineering majors. Students from other disciplines can apply after consultation with their academic advisors.

#### **Eligibility**

Co-op is available for full-time undergraduates pursuing a major in one of the sciences, engineering or the liberal arts. You are eligible at the end of your freshman year provided you meet the following requirements:

- complete all freshman year course requirements with a minimum 2.20 GPA;
- regularly attend scheduled Co-op Preparation Meetings; and
- commit to follow a five-year alternative work/study plan.

Due to the unique curriculum of the business program, including the volume of pre-professional experience obtained through a series of required internships, co-op is not an option for these students.

#### **Accreditation**

The Stevens Cooperative Education program is one of only 11 universities to be accredited by the Accreditation Council for Cooperative Education. For more information visit <http://www.co-opaccreditation.org>.

#### **To Apply**

You need to attend the first Co-op Preparation Meeting held during your first semester at Stevens. For more information contact the Office of Cooperative Education, Wesley J. Howe Center, 7th floor, (201) 216-5368, or visit <http://www.stevens.edu/co-op>.

#### **UNDERGRADUATE PROJECTS IN TECHNOLOGY AND MEDICINE (UPTAM)**

A unique 10-week summer program of student research, Undergraduate Projects in Technology and Medicine (UPTAM) is designed to stimulate and encourage talented undergraduate students to apply their engineering and scientific training to research problems in medicine, dentistry and the life sciences. Participants are selected on a competitive basis and a limited number of stipends are available.

UPTAM involves Stevens, the University of Medicine and Dentistry of New Jersey, and other area medical facilities. It enables you to apply knowledge of technology to medical research projects often conducted at

the laboratories of a participating medical facility. Included among these projects have been:

- Bile acid analysis by mass spectrometry for liver cancer studies;
- Liver cell regeneration, search for mutation, virtual reality techniques, synthetic modification of Taxol, EKG studies using neural networks, countercurrent chromatography and iron metabolism in renal failure; and
- Use of computer graphics for examining the shape of proteins.

UPTAM students have also been involved in designing an oxygen measuring device for newborn infants, a portable artificial respirator, an artificial dialyzer/oxygenator for blood and a lemniscate cardiogram for the diagnosis of heart problems.

As a result of your UPTAM program, you could, as several undergraduates do each year, author or co-author papers and reports with faculty members that may be presented to professional societies or published in professional journals. The stimulus of collaboration with medical researchers and the technical competence gathered through research appears to have aided UPTAM alumni in earning teaching or research assistantships in graduate schools or in entering schools of medicine or dentistry.

## **PRE-PROFESSIONAL AND ACCELERATED DEGREE PROGRAMS**

Stevens provides programs and advising services to students interested in pursuing a career in medicine, dentistry or law.

### **Pre-Medicine and Pre-Dental**

To prepare yourself for medical or dental school, you need an education that includes a strong foundation in the sciences (biology, chemistry, mathematics and physics), highly developed communication skills and a solid background in the social sciences and humanities. In addition, you must show that you have the potential to integrate both the science and the art of healing.

#### **Four-Year Program**

Any program at Stevens that includes the following courses satisfies the requirements for admission to accredited U.S. Medical schools and dental schools:

- Two years of chemistry with lab (Ch 115, 116, 117, 118, 241, 242)
- One year of general biology and one of advanced biology with lab (Ch 281, 381, 382)
- One year of physics with lab (PEP 111, 112, 221, 222)
- One year of mathematics (Ma 115, 116)
- One year of English, including writing and composition (any Hu 100-level course)

In addition to the above minimum requirements, the courses most often recommended are the following: genetics, biochemistry, immunology, physiology, inorganic and/or physical chemistry and English literature.

You should ask about the requirements of specific schools and prepare your study plans at Stevens accordingly. You should also complete the minimum required courses by the end of your junior year at Stevens so you can take the national exam - the Medical College Admission Test (MCAT) for medical school or the Dental Admission Test (DAT) for dental school - in the spring of your junior year at Stevens. We strongly encourage participation in summer research, such as Undergraduate Projects in Technology and Medicine (UPTAM), community service or hospital service.

#### **Accelerated Three-Year/Seven-Year Programs**

The following options leading to combined degrees with a prestigious area medical school or dental school are available through our accelerated three-year programs. Admission to these programs is highly competitive. The requirements are listed in the "Applying for Admission to Stevens" section in this catalog.

**The Combined B.S.-M.D. Program** gives you the opportunity to earn the B.S. degree in one of the sciences at Stevens and the M.D. degree at the University of Medicine and Dentistry of New Jersey (UMDNJ) - New Jersey Medical School in a total of seven years. If you are a high school senior who has demonstrated academic excellence and a promise for a career in medicine, you can be considered for the B.S.-M.D. program. If accepted to this program, you must complete three years in the Accelerated Chemical Biology program with a GPA of at least 3.40 and obtain acceptable scores on the MCAT exam. Promotion to the medical school is automatic without further application. Stevens awards the B.S. degree upon successful

completion of the first year of medical studies.

**The Combined B.S.-D.M.D. Program** gives you the opportunity to earn the B.S. degree in one of the sciences at Stevens and the D.M.D. degree at the University of Medicine and Dentistry of New Jersey (UMDNJ) - New Jersey Dental School in a total of seven years. If you are a high school senior who has demonstrated academic excellence and a promise for a career in dentistry, you can be considered for the B.S.-D.M.D. program. If accepted to this program, you must complete three years in the Accelerated Chemical Biology program with a GPA of at least 3.40 and obtain acceptable scores on the DAT exam. Your promotion to the dental school in the fourth year of the articulated program is contingent upon satisfying these requirements. Stevens awards the B.S. degree upon successful completion of the first year of dental studies.

### Pre-Law

The Stevens humanities curriculum includes a pre-law concentration which prepares you for admission into premier law schools. Our law school advisor helps you choose the courses that suit your talents and interests, as well as prepares you for the Law School Admission Test (LSAT) which you take in your junior year at Stevens.

The Combined B.A., B.E. or B.S.-J.D. Program gives you the opportunity to earn the B.A., B.E. or B.S. degree at Stevens and the J.D. degree at New York Law School in a total of six years. Stevens awards the B.A., B.E. or B.S. degree upon maintaining a GPA of at least a 3.00 at Stevens and upon successful completion of the first year at New York Law School.

### ROTC

Stevens offers Army ROTC through a program at Seton Hall University in South Orange, NJ.

#### Army ROTC (AROTC)

Seton Hall has a long tradition of association with the ROTC program. ROTC is a college course in leadership training that is open to all students. ROTC prepares students for success in life by training them to be leaders in their chosen field, whatever that may be. ROTC will not limit your choice in major, your ability to play a sport, join a club, or have a job. Students enrolled in ROTC represent a wide cross-section of the university; the thing they have in common is the desire to excel in college and beyond. ROTC is a college elective that tells future employers that you have real-life experience handling people and solving problems. Enroll for two years with no obligation. Enroll for no cost, when not taken for credit.

For those students who so chose, ROTC can lead to a commission as an officer in the U.S. Army. Army officers are the upper management of the Army. They work in a wide variety of fields on Army bases around the country and throughout the world. Officers can serve their country full time on active duty or part time as a citizen-soldier in the Army Reserve or National Guard.

The ROTC Program annually awards two-, three- and four-year scholarships on a competitive basis to outstanding young people who are interested in receiving a commission in the United States Army. Scholarships currently provide up to \$17,000 per year for tuition and fees; \$600 as a textbook allowance and a stipend of up to \$400 per month, for up to 10 months each school year. Any citizen, including those who are cross-enrolled at nearby colleges and universities, may apply.

For those considering a nursing career, the Seton Hall ROTC program has been designated as a Program for Nursing Education Center; it works closely with nursing students, enabling many to start their careers successfully as Army nurses. Scholarships for nursing majors are designated annually.

ROTC can be completed in two, three or four years. We work with you to develop the best program to meet your needs. The courses aid students by providing leadership and management experience; developing self-discipline, physical stamina and poise; enhancing development of management skills; and developing qualities basic to success in any career. Depending on the degree program, a maximum of 22 credits in ROTC courses may be applied toward a bachelor's degree.

In keeping with the military's demanding challenges, physical fitness is an extremely important part of the ROTC experience. All cadets participate in supervised physical training designed to gradually bring the

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**Deleted:** Air Force ROTC (AFROTC)

Reserve Officer Training Corps (ROTC) is an educational program designed to give men and women the opportunity to become Air Force officers while completing their undergraduate degrees. The Air Force ROTC program is designed to prepare you to assume positions of increasing responsibility and importance in the modern Air Force. Air Force ROTC offers two primary routes to an Air Force commission at over 700 institutions throughout the continental United States, Hawaii and Puerto Rico: The ROTC AF Four-Year Program and the ROTC AF Two-Year Program. ¶  
**The Four-Year Program**

The General Military Course (GMC) is the first half of the Four-Year Program and is generally taken during your freshman and sophomore years. This program allows you to "try out" Air Force ROTC for up to two years without incurring any obligation (unless on an Air Force scholarship). As you attend a one-credit hour class each semester, you'll learn more about the Air Force and the historical development of airpower. The second half, called the Professional Officer Course (POC), is highly competitive. These junior and senior level 3-credit courses cover management and leadership skills, national defense policy and preparation for active duty. ¶  
**The Two-Year Program**

This program, also called the POC, is primarily available to junior college transfer students, sophomores and veterans who have at least two years of college remaining (undergraduate, graduate or combination of the two). It is especially for those who are majoring in selected scientific and technical areas, such as mathematics, physics, meteorology, engineering and computer science. This pro( ... [2]

individual to a high level of health and fitness.

The advanced course also includes, for qualified cadets seeking a commission, a requirement to attend the five-week National Advanced Leadership Camp (NALC), during the summer between the junior and senior years; the cadet is further trained and evaluated for leadership potential. While at NALC, cadets receive pay, travel and benefits.

#### **Cross-Enrollment**

The Department of Military Science offers students attending nearby colleges and universities the opportunity to participate in ROTC through a cross-enrolled program where cadets attending other institutions commute to Seton Hall to participate in ROTC.

Basic courses are as follows:

#### **ROTC 1101/0101 Foundation of Officership (2.0)**

Discuss the organization and role of the Army. Introduction to leadership, military customs and traditions. Review the basic life skills pertaining to fitness and communication. Analyze Army values and expected ethical behavior. Corequisite: Leadership Laboratory.

#### **ROTC 1102/0102 Basic Leadership (2.0)**

Practice basic skills that underlie effective problem solving and learn briefing techniques and the army writing style. Apply active listening and feedback skills. Examine factors that influence leader and group effectiveness. Examine the officer experience and life in the Army. Corequisite: Leadership Laboratory.

#### **ROTC 2201/0201 Individual Leadership Studies (3.0)**

Develop knowledge of self, self-confidence and individual leadership skills. Develop problem solving and critical thinking skills to include goal setting and the decision-making process. Apply communication, feedback and conflict-resolution skills. Corequisite: Leadership Laboratory.

#### **ROTC 2202/0202 Leadership and Teamwork (3.0)**

Focuses on self-development guided by knowledge of self and group processes. Challenges current beliefs, knowledge and skills while focusing on teamwork and group process. Provides equivalent preparation for the ROTC Advance Course as the Leaders Training Course. Corequisite: Leadership Laboratory.

Advanced courses are as follows:

#### **ROTC 3301/0301 Leadership and Problem Solving (3.0)**

Examines basic skills that underlie effective problem solving. Analyze the role officers played in the transition of the Army from Vietnam to the 21st century. Review the features and execution of the Leadership Development Program. Analyze military missions and plan military operations for small unit tactics. Corequisite: Leadership Laboratory.

#### **ROTC 3302/0302 Leadership and Ethics**

Probes leader's responsibilities that foster an ethical command climate. Develop confidence and leadership competencies. Recognize leader responsibility to accommodate subordinate spiritual needs. Apply principles and techniques of effective written and oral communication. Instruction to National Advanced Leadership Camp (NALC) procedures. Prerequisite: ROTC 3301/0301 Corequisite: Leadership Laboratory.

#### **ROTC 4401/0401 Leadership and Management**

Builds on NALC experience to solve organizational and staff problems. Discuss staff organization, functions and processes. Examine principles of subordinate motivation and organizational change. Analyze counseling responsibilities and methods. Apply leadership and problem-solving principles to a complex case study and simulation. Prerequisite: ROTC 3302/0302. Corequisite: Leadership Laboratory.

#### **ROTC 4402/0402 Officership**

Capstone course designed to explore topics relevant to second lieutenants entering the Army. Describe legal aspects of decision making and leadership. Analyze Army organization for operations from the tactical to strategic level. Assess administrative and logistics management functions and perform platoon leader actions. Examine leader responsibilities that foster an ethical command climate. Prerequisite: ROTC 4401/0401.

Corequisite: Leadership Laboratory.

Advanced Independent Study courses are as follows:

**ROTC 5501/0501 Applied Leadership**

Independent study of applied leadership through battlefield case studies. Prerequisite: ROTC 4402/0402.

**ROTC 5502/0502 Leadership in the 21st Century**

Independent study of the demands of leadership in today's Army and the Army of the future. Prerequisite: ROTC 5501/0501.

For additional information about the Army ROTC program, contact the Department of Military Science at Seton Hall University, (973) 763-3078 and (973) 761-9446.

### **SPONSORED SENIOR DESIGN PROGRAM**

The Sponsored Senior Design Program provides an opportunity for a team of engineering and/or computer science students to round out their education by completing a two-semester industry-sponsored design project. Typically the sponsoring company proposes one or more potential design projects which are reviewed by a faculty design coordinator.

A suitable project is one that provides value to the sponsor, can be completed in the allotted time and meets the academic requirements of the program. For example, NASA supports the revitalization of aviation transport for small business and personal aircraft with a maximum commute of 800 miles per day; a group of Stevens students designed an aircraft to meet these specifications. Stryker Howmedica Osteonics wants an electronic tracking system to properly align the acetabular implant during hip arthroplasty. Our students met the challenge despite having to eliminate electrical interference from the materials used in the instruments and create a non-reusable subcomponent.

### **THE STEVENS SCHOLARS PROGRAM**

The Stevens Scholars Program offers qualified students the opportunity to focus on several areas of study, and to either participate in undergraduate research or pursue an accelerated program leading to a bachelor's degree in three years or a dual bachelor's/master's degree in four years. As part of the Scholars Program, we offer special honors seminars at the freshman and sophomore levels in chemistry, computer science, mathematics and physics.

In addition to one semester course per semester, Stevens requires Scholars Program students to take H183 through H186, Honors Research Seminars I through IV. Upon completion of the freshman year, you must have a cumulative GPA of 3.20 or better.

As a Stevens Scholar, you have the opportunity to work on a special research project with a Faculty Research Mentor during the summer months. Participation in special research is subject to the availability of suitable projects and the approval of a Faculty Research Mentor. Students working on these projects receive a stipend and, if residence hall rooms are available, free campus housing during each summer project period. If you wish to pursue an accelerated program instead of conducting summer research, you can take up to four tuition-free courses each summer.

### **STEVENS TECHNICAL ENRICHMENT PROGRAM (STEP)**

The Stevens Technical Enrichment Program (STEP) is an umbrella operation whose primary goal is to increase the pool of underrepresented groups within the fields of engineering, science and other technical careers. STEP is comprised of two components: the Bridge Program and the Education Opportunity Fund.

Bridge is a network of interrelated programs, services and activities that promote and support the academic, personal and professional development of its participants who are members of the Stevens undergraduate community. Bridge is committed to working with the "whole" student, and currently offers these services and activities: mentoring, counseling, tutoring, academic advising, career advising/planning, personal and professional development workshops/seminars, social stress relievers and opportunities for community outreach. Bridge is subdivided into a summer experience and an academic year program.

Prior to their first year at Stevens, Bridge students attend a rigorous six-week summer residential pre-freshman experience that offers them a simulation of the first semester and the opportunity to begin developing relationships with classmates, faculty and staff. The academic year continues and expands upon

the services that are offered during the summer. Stevens' undergraduates who did not participate in the summer program are eligible to join Bridge during the academic year.

The New Jersey Educational Opportunity Fund (EOF) is a state-funded financial aid and support program offered to students who meet the state-mandated financial and education guidelines. EOF students receive a financial award and required specific support services. STEP administers the EOF program and, as such, EOF recipients participate in the programs, services and activities offered by STEP. Prospective EOF freshmen are required to attend the summer pre-freshman experience.

STEP also supports and encourages community outreach efforts and provides guidance and support to the following student run organizations: National Society of Black Engineers (NSBE); Society of Hispanic Professional Engineers (SHPE); Latin American Association (LAA); and the Black Student Union (BSU).

For more information, you may contact the STEP Department, Wesley J. Howe Center, 5th floor, (201) 216-5387.

## **STUDY ABROAD**

Stevens students who have participated in study-abroad programs found that the year or semester abroad enhanced their opportunities for employment and/or professional studies. They also found ample time for sight-seeing and other enriching cultural experiences.

Selected Stevens students may spend their junior year at the University of Dundee in Scotland to take courses comparable to those in the junior year of their Stevens curriculum and receive credit toward the Stevens baccalaureate degree. The University of Dundee is a large, modern university with diverse programs; it has particularly strong programs in civil engineering, manufacturing engineering, electrical engineering and the sciences. The cost of the year abroad at Dundee, including tuition, room and board, is similar to the cost of one year at Stevens. Selection for the University of Dundee program is competitive. To be eligible, you must apply in the spring of your sophomore year, have at least a "B" average and demonstrate personal maturity and a capacity for independent study.

In addition to the University of Dundee Program, other study-abroad opportunities may be available during the sophomore or junior years. Recently, the University of Sydney, Australia, became one of the most popular destinations for Stevens students. Spain, Austria and England are other countries in which Stevens students spend study-abroad terms. Information regarding study-abroad programs and opportunities may be obtained from the Office of the Dean of Undergraduate Academics, Wesley J. Howe Center, 10th floor, (201) 216-5576.

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Air Force ROTC (AFROTC)

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Aerospace course descriptions include:

AS 100 (1-1.5-1)

A survey course designed to introduce students to the United States Air Force and Air Force Reserve Officer Training Corps. Featured topics include: mission and organization of the Air Force, officership and professionalism, military customs and courtesies, Air Force officer opportunities and an introduction to communication skills. Leadership Laboratory is mandatory for AFROTC cadets and complements this course by providing cadets with followership experiences.

AS 200 (1-1.5-1)

This course examines general aspects of air and space power through a historical perspective. Utilizing this perspective, the course covers a time period from the first balloons and dirigibles to the space-age global positioning systems of the Persian Gulf War. Historical examples are provided to extrapolate the development of Air Force capabilities (competencies) and missions (functions) to demonstrate the evolution of what has become today's USAF air and space power. The course also examines several fundamental truths associated with war in the third dimension. As a whole, this course provides the students with a knowledge level understanding for the general element and employment of air and space power, from an institutional, doctrinal and historical perspective. In addition, the students continue to discuss the importance of the Air Force Core Values with the use of operational examples and historical Air Force leaders and continue to develop their communication skills. Leadership Laboratory is mandatory for AFROTC cadets and complements this course by providing cadets with followership experiences.

AS 300 (3-1.5-3)

This course is a study of leadership, management fundamentals, professional knowledge, Air Force personnel and evaluation systems, leadership ethics and communication skills required of an Air Force junior officer. Case studies are used to examine Air Force leadership and management situations as a means of demonstrating and exercising practical application of the concepts being studied. A mandatory Leadership Laboratory complements this course by providing advanced leadership experiences in officer-type activities, giving students the opportunity to apply the leadership and management principles of this course.

AS 400 (3-1.5-3)

This course examines the national security process, regional students advanced leadership ethics and Air Force doctrine. Special topics focus on the military as a profession, officership, military justice, civilian control of the military, preparation for active duty and current issues affecting military professionalism. Within this structure, continued emphasis is given to refining communication skills. A mandatory Leadership Laboratory complements this course by



providing advanced leadership experiences in officer-type activities, giving students the opportunity to apply the leadership and management principles of this course.

For additional information about the Air Force ROTC program, contact the Department of Aerospace Studies at NJIT, telephone: (973) 596-3626, e-mail: [afrotc490@njit.edu](mailto:afrotc490@njit.edu).