The Master of Science in Forensic Science at Cedar Crest College
The demand for forensic science services has continued to grow since the advent of forensic DNA testing in the late 1980s. The success of DNA technology in solving cold cases, identifying perpetrators of crime through DNA databases, and overturning wrongful convictions, has galvanized political leaders and criminal justice professionals into supplying the resources for infrastructure, capital expenditures, and yearly operating costs for maintaining the current demand for forensic services. As a result of the impact of forensic DNA testing on the criminal justice system, other areas of forensic science are beginning to attract interest. Particularly within the private sector, new technologies in areas such as biometrics and drug testing are becoming available. Although the country has met the challenge of creating better technologies and constructing new laboratories, there is a shortage of intellectual capital needed to staff forensic science positions. Properly educated scientists are needed not only to fill new positions but also to fill existing positions due to retirement and turnover. As a result of greater scrutiny of forensic science work by the legal community and the onslaught of accreditation mandates from the professional community, a better-educated scientist is needed. This program will help meet that need.

The Master of Science in Forensic Science Program at Cedar Crest College is not geared toward any one particular discipline in forensic science. Although specialization is the order of the day among forensic science practitioners, the program is taught from a generalist perspective. Given that physical evidence can take an endless array of forms, we strongly believe that a knowledge base in all the requisite forensic science disciplines is important for the practitioner. A forensic biologist, for example, should never anticipate that biological evidence will be devoid of trace or pattern evidence. In practice, an item of physical evidence is likely to contain probative information in a variety of forms, whether it is physical, biological or chemical. Furthermore, we believe that there are certain philosophical tenets that are common to all forensic science disciplines and that forensic science is a separate and unique science. We do not subscribe to the idea that forensic science is simply an “applied science”.

We believe the program differs from most others of its kind due to the emphasis we place on research and developing leadership qualities in students. We believe that there is no better way to develop scientists than by placing research as the foundation for the program. It is also our hope that this program will prepare you not only for a career in forensic science but to inspire you toward leadership positions in the field as well. Given the pertinent role that forensic science now plays in the criminal justice system, the development of future leaders is necessary for the field to continue to fulfill its professional mandate.
Philosophy of Graduate Education at Cedar Crest College

Building upon the college’s tradition of teaching excellence, graduate education at Cedar Crest aspires to provide students with the expertise, judgment, vision, and inspiration to participate actively and responsibly within the diverse communities and dynamic knowledge networks wherein their professional lives will unfold. Institutionally, this commitment rests upon four values which serve as the foundation for the college’s philosophy of graduate education:

Scholarship: Graduate programs should ensure that students master the theoretical perspectives, methodological techniques, and professional practices essential to the production of knowledge within their disciplines. This includes exposing students to an expanded definition of scholarship, which moves beyond the traditional emphasis upon discovery to include the integration, application and dissemination of knowledge within and across disciplines.

Innovation: Graduate programs should ensure that students recognize the role that creativity, and the entrepreneurial spirit more generally, plays as a catalyst for the advancement of knowledge. While programs should acknowledge the value of risk-taking as an inherent element of scholarly practice, students also should learn that professional conduct must be tempered by an ethic of responsibility for the communities within which they live, work and learn.

Collaboration: Graduate programs should ensure that students understand how the revolution in information technology is profoundly altering the nature of professional practice by empowering epistemic communities from around the world to respond to issues of local, national and global significance. Programs should equip students with the communications and technological skills needed to collaborate within the context of transnational and interdisciplinary networks that serve as sites for the production, application and dissemination of knowledge.

Professionalism: Graduate programs should impress upon students that graduate school itself is but the prelude to a lifetime of ongoing professional development. Faculty should convey this message by modeling professional practices within the context of an active research agenda and other forms of scholarly activity which contribute to the production, dissemination and application of knowledge within and across disciplines. Similarly, the college should demonstrate its commitment to educational leadership by providing academic programs, faculty, and the graduate community more generally, with the institutional support needed to sustain high levels of academic achievement in the face of evolving professional, societal, and global standards.

The History of Forensic Science Education at Cedar Crest College

Cedar Crest College continues its commitment to forensic science education through the inception of the Master of Science in Forensic Science Program in 2007. In the past decade, Cedar Crest College has developed both a nationally recognized undergraduate forensic science program and a Forensic Science Training Institute. The undergraduate forensic science program has produced over 60 graduates many of whom are now forensic science professionals. In 2004, the undergraduate forensic science program was one of five programs that received accreditation through the Forensic Science Educational Programs Accreditation Commission (FEPAC) in the commission’s inaugural accreditation cycle. Since then, the program has expanded its faculty and resources and continues to be a leader in forensic science undergraduate education.

The Cedar Crest College Forensic Science Training Institute has become a leader in the continuing education of forensic science professionals. Since 2003, the Cedar Crest College Forensic Science Training Institute has contributed to the training of over 200 forensic scientists from around the nation by providing training in 1 to 5 day workshops in a variety of forensic science disciplines. Currently, workshops are being funded through a grant from the National Institute of Justice which has allowed the Institute to expand its course offerings. In addition to the faculty at Cedar Crest College, some of the most well known professionals in forensic science have contributed to the instruction of workshops at the Institute.

The development of a master’s program in forensic science will not only continue the College’s commitment to excellence in forensic science education but will also provide the opportunity for students and faculty to contribute meaningfully to forensic science in the area of research. In the first year students have given over ten presentations at regional and national conferences and have produced two peer-reviewed publications based on research associated with their master’s theses. It is through this emphasis on research that the program hopes to further the development of not only the scientific abilities but the leadership qualities of students as well. Given the pertinent role that Forensic Science now plays in the criminal justice system, the development of future leaders is necessary for Forensic Science to continue to fulfill its professional mandate.

Program mission statement

To teach and continually emphasize forensic science foundational principles in all aspects of instruction to students who have a solid background in the natural sciences to help produce a future generation of competent, credible and ethical forensic scientists.
Dr. Lawrence Quarino, **Program Director**

**Education**
- BS  Biology, Saint Peter's College
- MS  Forensic Science, John Jay College of Criminal Justice
- Ph.D.  Forensic Science, City University of New York

**Prior Professional Experience**
- New Jersey State Police (1986-1990)
- New York City Medical Examiner’s Office (1990-2001)

**Recent Publications**

**Notable Appointments**
- 2006-Present  Commissioner, Forensic Science Educational Programs Accreditation Commission
- 2003-2008  Board of Directors, American Board of Criminalistics

The fundamental mission of our master’s program is to offer the student the best possible graduate education in forensic science. I want to instill in our students a commitment to excellence and to help create the next generation of leaders in the profession. The program at Cedar Crest is generalist-based because we believe that a commonality exists in all types of physical evidence, regardless of their physical, chemical, or biological nature. This commonality is based on the premise that in any given crime, evidence of many different forms is created. To understand the event, all the evidence must be considered. It is hard to solve the puzzle, when parts of the puzzle are left out. I am interested in creating forensic scientists, not just forensic biologists or forensic chemists.

I am also a strong proponent of master’s thesis research. As a program, I believe it is extremely important to contribute to the body of knowledge in the field. I also believe that the best way to train scientists is through research. On several occasions, laboratory directors have told me that they prefer to hire employees who have performed a master’s thesis because they can think better and are better able to solve problems than those who have not.

As a former supervisor at the Department of Forensic Biology in the New York City Medical Examiner’s Office, I watched the DNA revolution unfold and transform forensic science. In my own professional lifetime, I’ve seen forensic science ascend to the front lines of the criminal justice system. Despite the success of the last few decades, many areas of forensic science need improvement. As a profession, we have not yet met our full potential. I entered teaching because I want to inspire students to become the future leaders of the profession who will continue to move forensic science forward and to continually improve our rapidly changing field. It is the sole reason for why I do what I do.

Dr. Thomas Brettell, **Assistant Professor of Chemistry**

**Education**
- BA  Chemistry, Drew University
- MS  Chemistry, Lehigh University
- Ph.D.  Analytical Chemistry, Villanova University

**Prior Professional Experience**
- New Jersey State Police (1976-2007)

**Recent Research Publications**
- E. L. Asselin, L. Smith, and T.A. Brettell, *A Raman and Infrared Vibrational Study of 1,2-Triazolo-benzodiazepines (In preparation).*

**Notable Appointments**
- 2003-Present  National Safety Council’s Committee on Alcohol and Other Drugs
- 2005-2006  ASCLD/LAB Board of Directors – Treasurer
- 2004-2006  New Jersey Governors’ Advisory Council Against Sexual Violence
- 2004-2006  Co-Chair of NJ Attorney General’s Commission on Forensic Science
- 2003-2006  Technical Advisory Board – New Jersey Violent Death Reporting System
I recently joined the faculty here at Cedar Crest College after retiring as the Director of the New Jersey State Police Office of Forensic Science with 31 years of experience in the field. I do not view myself as in ‘retirement’ but starting my career in academia. While working as a Forensic Scientist I taught forensic science courses as an adjunct faculty and truly loved teaching. With my background as a professional in the forensic science field I work to bridge the theory between the textbook and actual casework, with an enthusiasm and credibility that the students can appreciate. Because of this connection and good, open communication, they are able to grasp the knowledge from both a theoretical and practical aspect.

In addition to my teaching, my current professional involvement and mentoring of students in their research, is an experience from which the students benefit. I believe my present professional involvement adds to my knowledge and skills as a teacher and mentor. This experience allows me to provide the necessary foundation to train and mentor future forensic scientists and chemists. I view my mentoring relationship seriously, and as a lifelong bond with the student that will continue and build as a professional relationship in their career. Teaching and mentoring in both the undergraduate and graduate program allows for the best opportunity to share my knowledge and experience to my students on a one-on-one basis.

Brian Gestring, Assistant Professor

Education
BS Biology Major, Chemistry Minor, Rutgers University
MS Forensic Science, John Jay College of Criminal Justice

Prior Professional Experience
Forensic Consultant (2004 to Present) – [Forensic Casework/Training/Administration]
Nassau County Medical Examiner’s Office (1994-1997) – [Death Investigation]

Notable Appointments
2008 President, Council on Forensic Science Education
2008 – Present Bethlehem Police Department Community Advisory Committee
2006 – Present NYPD Forensic Science Oversight Committee
2003 – Present FEPAC Accreditation Site Evaluator
2002-2007 Developed and Directed the Undergraduate & Graduate Forensic Science Programs at Pace University
1993-1995 Forensic Consultant on NBC Productions the “The Cosby Mysteries”
1998 Forensic Consultant on NBC Productions “Law & Order”

Recent Publications


Upon their first meeting, the slender man with the intense stare and the eagle like face pronounced “you came from Liberton. You drive two horses, one gray, and one bay, and you are probably employed by a brewery.” After all the assumptions were confirmed and the man from Liberton left, the slender man explained himself. “I saw the clay from Liberton on the fellow’s boots. He had gray hairs on one sleeve and bay hairs on the other. As for my final bit of deduction, you probably observed the face, especially the nose.”

While this exchange has all the hallmarks of the most famous fictional detective, it was neither Sherlock Holmes nor fictional. It was only one of many accounts of the keen observational and interpretative skill of a Scottish physician named Dr. Joseph Bell. This account was originally recorded by Hesketh Pearson and then obtained by Ely Liebow for his work on Dr. Bell’s biography. Dr. Bell used what he termed as “the method” every day as he treated patients and taught medical students like the young Arthur Conan Doyle.

Dr. Bell’s keen insights did more than just help his patients and provide the inspiration for Conan Doyle to create Sherlock Holmes. Since the 1870’s, Dr. Bell used his talents to aid the crown with criminal investigations. He continued on this path for nearly 20 years. For a time he was even involved with the Jack the Ripper investigation. The discretion Dr. Bell exercised regarding his involvement in these cases has resulted in a lack of appreciation for the central role he played in fostering the scientific investigation of crime.

As more of the historic literature in Forensic Science is explored, it becomes apparent that forensic science was not only used at trial, but as an active part of the investigation to develop suspects. Similar feats of observational prowess and interpretive intellect are present in works from Hans Gross and Edmund Locard, to Paul Kirk. Yet somehow over time the laboratory became removed from the investigation assuming a more reactive role. The scientist was detached from the inception of the investigation at the crime scene. Slowly, the concept of a general knowledge of forensic science or a “generalist” started to give way to the concept of a laboratory specialist.

I believe that by educating the next generation of forensic scientists, we can recapture that original essence of where our field started. Our students develop a strong generalist perspective and discipline specific knowledge through their coursework. They also hone their analytical thought process through thesis based research. This combination allows our students to succeed anywhere in the field from the crime scene to the forensic laboratory.
Dr. K. Joy Karnas,  
**Associate Professor of Biology, Director of Genetic Engineering**

**Education**  
Ph.D.  University of Arizona  
M.A.  College of William and Mary  
B.S.  College of William and Mary  

My career path brought me to Cedar Crest College in the Fall of 2001. It was an obvious choice for me, as the college exemplifies everything that I believe an academic institution should be. The primary focus here is the education of future leaders. Teaching is the primary responsibility of faculty, and in the sciences it is required that all faculty include students in their research labs. Additionally, there are many opportunities for faculty to participate in interdisciplinary initiatives. As a professor in the Department of Biological Sciences, I love that I can work with forensic science students in both the classroom and laboratory, and participate in science education programs. At a small college like Cedar Crest, I feel that it is important and noteworthy that faculty from different departments have the flexibility to work with these students who have interdisciplinary interests.

Science literacy is essential for individuals at all academic levels. While I primarily work with undergraduate Genetic Engineering majors, I also regularly teach the Molecular Biology course for the Master's in Forensic Science Program and mentor research projects for freshman biology students. I have coordinated grant-funded internships for college students to explore careers in science education, and have worked as a content specialist for the grant-funded DaVinci Institutes for the professional development of elementary school teachers. The latter program encourages teachers to use the pedagogical inquiry-based learning process to teach science, engaging students and facilitating the learning process. In addition, since so little time in elementary school is dedicated to science, we help teachers find ways to incorporate science education into all facets of learning—literacy, mathematics, art, social studies, etc. Finally, I love visiting elementary school classrooms and inspiring students to explore the world around them—working with children is an amazing experience.

I chose my career in education primarily because of my own experiences as an undergraduate. I was influenced by a faculty who believed that a student-centered, interactive education provided the best learning environment. I have taken this lesson to heart and have created the same experience for my own students. In my lectures, I encourage students to analyze and interpret data as they develop a deeper understanding of the molecular basis of life, and I also promote classroom discussions centered on the ethics of genetic research and the applications of scientific research to societal issues. I believe that most learning is experiential in nature, and feel that laboratory hands-on training is essential. The majority of my coursework has a laboratory component in which students experience the technologies that we have discussed in lecture. In addition, I feel that original research provides an opportunity for students to explore the nature of science, from forming a research question to developing methodologies to answer that question, and then, finally, analyzing and contextualizing results.

Everything about my research lab is student-driven—while I oversee and mentor the projects, my students are the ones who conduct the majority of the research. The broad theme of my research is the molecular basis of gene expression, primarily the biosynthesis of lipoprotein particles (e.g. LDL and HDL) using an insect model, the tobacco hornworm (Manduca sexta) for study. Some of the research projects that students have done include: fluorescently labeling the lipoproteins to visually explore their expression within the cell, altering the coding sequence to examine the affect on processing reactions, using qPCR to determine the timing of gene expression in the insect, and using Drosophila and Saccharomyces cell systems for expressing altered genetic sequences. In addition, I have had several students explore molecular interests tangentially related to my main focus. Currently, I have students using Manduca sexta as a marker for environmental contaminants as they explore the molecular response of the tobacco hornworm to toxins in its diet. I have also worked with a forensic science student as she used polymorphic short tandem repeats in bacteria species to connect assailants and victims through bitemarks inflicted during a crime. I feel that research provides a great tool for education, an enriching experience that opens doors for students as they pursue careers in science.

Dr. Marianne Staretz, Associate Professor  

**Education**  
B.S.  Biochemistry, University of Scranton (1986)  
Ph.D.  Bioorganic Chemistry, State University of New York, Binghamton, NY (1992)  

**Prior Professional Experience**  
American Health Foundation (1992-1997)  
University of Scranton (1997-2000)

**Select Publications/Presentations**  


I am somewhat unique compared to other faculty in the forensic science graduate program in that my official training was not in the area of forensic science. I have a BS in Biochemistry and a PhD in Bioorganic Chemistry. My doctoral research was in the area of drug-protein interactions. I then went on to do some research in the area of carcinogenesis and toxicology.

I came to Cedar Crest College after doing research for several years because I was ready to share what I had learned. I knew from my teaching experiences in graduate school that teaching was my passion. I always intended to enter academics but needed those few years of research to broaden my knowledge base. The Cedar Crest dedication to education eventually brought me here.

How did I get involved in the forensic science program? Having been around the undergraduate forensic science program at Cedar Crest for a few years, it drew me in. As it draws the interest of many students, it also drew the interest of me. It is an enticing field for me, in part, because of the nature of the field but also because it is a field that is growing. There is much work that still needs to be done in the area of forensic science. The research component of the graduate program is making some novel and needed contributions to the field and our graduates are well trained to continue making those contributions to the field after they leave.

My involvement in the graduate program highlights the foundation of the field in the other sciences. I can take my background in Biochemistry and Toxicology and use it in the forensic science area. The graduate program emphasizes this aspect of forensic science and gives students the flexibility to venture into many different areas of forensic science.

**Larry Quarino:**

I am a strong believer in strong body and strong mind. My father took me to a Yankee game when I was six and I have been in love with sports ever since. I believe that many of life’s lessons can be learned on the athletic field many of which apply to the classroom and to professional life. Athletics are an excellent blueprint for a life well lived. Just check the list of world and corporate leaders and you will find that for many of them, athletics have played a key role in their life. Sports teach you to deal with adversity, to persevere, and that true success can only come from working hard. I have had the good fortune to be a part-time coach on Cedar Crest’s women’s softball team and have found that those players who work hard at athletics do the same in academics. Now if only I can convince my graduate students to come running with me in the morning!

**Tom Brettell:**

When I was a child I would place my small transistor radio under my pillow and listen to Richie Ashburn announce the Phillies games. My parents thought I was sleeping. Ever since I have been small I have been an avid baseball Phan. I coached little league for 18 years, watching my three sons play at all different levels of organized sports. Now I go to watch them coach their high school varsity team. Parents ask me “Which one is your son?” and I answer “The Coach!” Now when there is no game to watch you can find me on the golf course, mostly in the ‘rough’. When not grading exams or reading theses, you can find me tending to my lawn and shrubs, or of course, spoiling “Charlie”, our 4 ½ pound toy Chihuahua.

**Brian Gestring:**

I guess the thing that drew me into science in the first place was an innate curiosity of how things worked. Ever wonder how the professor was able to make everything out of coconut shells on Gilligan’s Island? That might be an extreme example, but all around us are neat solutions to problems that we take for granted. I enjoy understanding them. I’ve worked as a carpenter and played as a shade tree mechanic. Unknowingly my two small boys are still feeding this habit. Now instead of changing car engines, I’m fixing Spiderman’s arm or Thomas the Tank Engine’s wheel.

**Joy Karnas:**

I started jogging in college as a way to stay in shape, and even ran a few 5ks and a half-marathon while in graduate school. I met my husband through a bike touring company, and we used to regularly go for day-long biking trips. When I moved out west to complete my doctorate, I picked up hiking and camping as a weekend pastime—the only way to truly appreciate the beauty of this country is to get out and walk up its mountains and down through its canyons. In more recent years, it’s difficult to find time for day-hikes, as most of my free time is dedicated to my role as soccer mom! I have two young sons, so Saturday double-headers are fairly common in the fall and spring, and I have a feeling that in a few years, when she’s old enough, my daughter will also pick up the sport. In the evening I can be found in my Allentown backyard oasis. I don’t think anything is more fun or relaxing than digging in my garden!

**Marianne Staretz:**

Hobbies?! With my current low supply of free time, any I do have is normally spent with my three children – ages 3-10. We enjoy swimming together. We recently installed a new pool. I am wondering if that was a good idea since we are now swimming even when temperatures are in the sixties (and the water is ice cold!). We play sports together – mostly kickball, baseball, and basketball. I enjoy watching them play in the community baseball and basketball leagues. I help coach softball – well a slight exaggeration – I am mainly the bookkeeper for the team (that is about all I am capable of). I really enjoy cooking. It must be a chemistry connection because I know many other chemists who like to cook. I sometimes wonder though, why I spend the time cooking, since my kids won’t eat anything that is not a chicken nugget!
Where Can You Find Our Graduates?

Graduates of our first class in 2008 can be found working or studying at the following agencies, corporations, and universities in a vast variety of capacities. These include:

- Chemistry Technician, Pennsylvania State Police Crime Laboratory (Greensburg, PA).
- Criminalist, New York City Office of Chief Medical Examiner, Department of Forensic Biology.
- Criminalist, New York City Police Department Forensic Science Laboratory.
- Doctoral Student, Florida International University, Forensic Chemistry Ph.D. Program.
- Laboratory Technician, Westchester County Crime Laboratory (Valhalla, NY).
- Research Scientist, L’Oreal Cosmetics (Clark, NJ).

Student Presentations at Professional Scientific Conferences

Students are encouraged to present their master’s thesis research at professional regional and national conferences. Program students have presented at meetings of the American Academy of Forensic Sciences, Northeastern Association of Forensic Scientists, International Association of Forensic Sciences, and the American Chemical Society. Below is the list of 2007-2009 presentations by our graduate students.


Nicole Deitz, Microscopic Examination of Blue Gel Inks After Cellulase Digestion of Paper, Sixtieth Annual Meeting of the American Academy of Forensic Sciences, Washington DC, February 2008.


Kim presenting at the 2007 American Academy of Forensic Sciences meeting in Washington DC.

Alumna Spotlight

Kimberly Michalik ’08

Kim is a 2008 graduate of the master’s program. She currently works in the Department of Forensic Biology at the New York City Medical Examiner’s Office as a Criminalist II.

The choice to attend Cedar Crest for a Master of Science degree in Forensic Science was without a doubt one of the best decisions I have ever made. I loved Cedar Crest College, and every moment of my time there. The lifelong friendships and connections made with professors there have proven priceless. The faculty, and staff, particularly of the graduate program, truly has the student’s future in mind. Professors always had an open door policy, and were there to answer any question, big or small, or to merely offer words of support and encouragement. There was always the push from professors to strive to do your best and to meet any, and all, goals. It was undeniably a family atmosphere.

The graduate program prepared me for my current position, in that it gave me a well-rounded scientific background both in chemistry and biology, as well as preparing me to work in the field of forensic science. As a chemist, I found it very easy to start my career in a forensic biology laboratory. I felt that I was prepared for the real world and that I was ready to step into any career choice. I was easily able to make the shift from student to professional due to my education at Cedar Crest. The hands-on experience of the program, and the ability to use instrumentation that is currently being used in the field was invaluable. The ever present ability to perform, present, and publish research, as well as attend forensic science conferences, allowed students the opportunity to meet professionals and become known within the field, while giving students the means to express themselves and broaden their educational knowledge in the field of forensic science.

I feel that the graduate program at Cedar Crest has prepared me far more than as compared to others in my peer group. A testament to this again is my ability to have an undergraduate degree in chemistry, and be able to cohesively work in forensic biology laboratory with little difficulty. I feel that I will be able to excel at the New York City Medical Examiner’s Office due to the education I obtained at Cedar Crest.
Partnerships

The Cedar Crest College Forensic Science Program works closely with many forensic science laboratories and academic programs on research, consultation, and training. Partners include:

- John Jay College of Criminal Justice
- New Jersey State Police Office of Forensic Sciences
- New York City Police Department Laboratory
- West Virginia University
- Willow Laboratories (Lynn, MA)

Cedar Crest College currently is also partnering with the Northeastern Association of Forensic Scientists (NEAFS) to offer summer workshops (through summer of 2010) for the continuing education of forensic science professionals through a grant from the National Institute of Justice.

Literature

Cedar Crest College has a wide variety of primary literature sources available for student use. In both the Cedar Crest College Cressman library and on-line students have access to over 200 textbooks on topics related to forensic science. The program also maintains subscriptions to several forensic science journals. Journals include:

- Canadian Society of Forensic Science Journal
- Forensic Science International
- Forensic Science International Genetics
- Journal of Clinical Forensic Medicine
- Journal of Forensic and Legal Medicine
- Journal of Forensic Identification
- Journal of Forensic Science
- Legal Medicine
- Science and Justice

Instrumentation

Many research opportunities exist at Cedar Crest because of the wide variety of instrumentation and other equipment available for student use. The list of available instrumentation and equipment include:

**Chromatography/Spectroscopy**
- Atomic Absorption - Buck Scientific ACCUSYS 211 Atomic Absorption Spectrophotometer
- Cecil 2041 UV/Vis Spectrophotometer
- Fluorimetry - Turner Quantech Digital Filter Fluorometer
- Fourier Transform Infrared Spectroscopy - Nicolet 380 FTIR; Nicolet Impact 410 FTIR
- Gas Chromatography - Hewlett Packard 5890 Gas Chromatograph (2)
- GC/MS Agilent Technologies 6890N Network GC System/5973
- Network Mass Selective Detector
- High Performance Liquid Chromatograph - Buck Scientific BLC-20 HPLC; Waters 490 HPLC
- Hitachi F-2500 Fluorescence Spectrophotometer
- LC/MS/MS - Applied Biosystems 3200 Q Trap
- Nuclear Magnetic Resonance - Varian EM-390, 90-mHz, CW NMR Spectrometer
- Pyrolysis GC - CDS Pyroprobe 5000
- SensIR IlluminatIR (micro-FTIR)zz
- Unicam Helios Alpha UV/Vis Spectrophotometer
- UV/Visible Spectrophotometry - Beckman Coulter DU 800 Spectrophotometer

**Biology/DNA Analysis**
- 310 Capillary Electrophoresis Genetic Analyzer
- ABI Veriti 96 well thermocycler
- Immunoassay Technology - BioRad ImmunoWash Model 1575; BioRad Microplate Reader 680
- Perkin Elmer 2700 DNA Thermal Cycler; Perkin Elmer 2720 DNA Thermal Cycler
- Real-time PCR - Corbett Rotor-Gene 6000 Real-Time Rotary Analyzer

**Microscopy**
- Fluorescence Microscopy - Leica DM1000 Fluorescent Light Microscope
- Polarized Light Microscopy - Leica DMEP Polarizing Light Microscopes
- Stereoscopes – Omega & Fisher Scientific Stereomaster Microscopes
- Scanning Electron Microscopy (SEM-EDS) - Philips XL-20 Scanning Electron Microscope w/EDS

**Crime Scene/Photography**
- Digital Photography - Fuji IS Pro IR/UV Digital Camera
- Nikon D70 Digital Camera
- Nikon D200 Digital Cameras
- Sirchie Electrostatic Dust Print Lifter
First Year Courses

Students in the forensic science program must complete undergraduate coursework in biochemistry, genetics, and instrumental analysis prior to registering for certain graduate courses. Students deficient in any of these courses must complete the course(s) during the first year. In addition, students are also required to have background through either undergraduate coursework or experience in crime scene reconstruction, pattern evidence, trace evidence analysis, microscopy, and forensic biology. Students deficient in any of these areas will be required to register for the following courses in the first year:

- CHE 241 Crime Scene Reconstruction and Pattern Analysis
- CHE 347 Trace Evidence and Microscopy
- CHE 348 Forensic Molecular Biology and Population Statistics

Students must also register for Thesis Prospectus (FSC 500, 2 credits) during the spring semester.

Summer Master’s Thesis Research Program

Students will be required to perform their master’s thesis research during the summer between the first and second year. Research can be performed on campus or at an external laboratory (requires prior approval from the program director). Cedar Crest College offers two summer sessions and students will be required to register for both sessions (FSC 501 and 502, 4 credits/session). Students will perform thesis research under the tutelage of a faculty member and will be expected to work full time during both sessions.

Second Year Courses

Although some graduate classes may be taken in the first year (depending on the amount of prerequisites needed), the second year of the curriculum will be dedicated to completing the coursework for the degree. Students will also be required to give a research seminar and to complete the writing of their thesis during the second year.

Graduate Courses

*Fall Semester:*
- FSC 599 Research 1 credit
- FSC 503 Graduate Seminar 2 credits
- FSC 505 Separations Chemistry 2 credits
- FSC 506 Analytical Spectroscopy 2 credits
- FSC 507 Forensic Chemistry 3 credits
- FSC 508 Forensic Toxicology 3 credits
- FSC 509 Advanced Crime Scene Reconstruction 2 credits

*Spring Semester:*
- FSC 599 Research 1 credit
- FSC 504 Graduate Seminar 2 credits
- FSC 510 Recent Advances in Forensic Biology 3 credits
- FSC 511 Molecular Biology 3 credits
- FSC 512 Forensic Science Administration 2 credits
- FSC 513 Advanced Microscopy 2 credits
- FSC 514 Legal and Ethical Issues in the Forensic Sciences 2 credits

Academic Progress

Students receiving a grade of C in any class must repeat that class. No more than one repeat is allowed for any one class. Any student that receives more than 3 C’s or receives a failing grade in any one course will be dismissed from the program.
Admission Requirements

The following criteria is recommended for admission:

- A Bachelor of Science degree from a regionally accredited college or university in a natural science (or equivalent coursework in a relevant following) including the following courses:
  - Two semesters of general (freshman) chemistry and two semesters of organic chemistry
  - Two semesters of calculus (differential and integral preferred)
  - Two semesters of physics
  - Two semesters of general (freshman) biology
  - A minimum cumulative GPA of 3.0
  - Completion of the GRE General Test (scores must be received by March 1st)
  - Two letters of recommendation from individuals who can attest to the applicant’s scientific ability.

Students under consideration for admission may be asked to interview with members of the forensic science faculty before acceptance to the program.

Applications received by January 2nd will be given admissions preference.

Maximum Period of Candidacy

Students have three years to complete the program from the date of matriculation unless exigent circumstances exist. Students requesting additional time to complete the program must submit a formal written request to the program director explaining the reason(s) for the extension request.

Transfer Credits

Students entering the program may transfer up to six graduate credits. Only courses listed in the curriculum will be considered.

Tuition and Fees 2009-2010

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<td>Graduate Tuition per credit</td>
<td>$609</td>
</tr>
<tr>
<td>Masters Thesis Fee (non-refundable)</td>
<td>$300</td>
</tr>
<tr>
<td>Prerequisite courses that are required for the Master of Science in Forensic Science Program per credit</td>
<td>$772</td>
</tr>
<tr>
<td>Student Activity Fee per semester</td>
<td>$10 per semester</td>
</tr>
<tr>
<td>Technology Fee</td>
<td>$100</td>
</tr>
</tbody>
</table>

Note to Fee Structure: The College reserves the right to change fees and charges when necessary. Books, supplies, lab materials and other program costs are not included in the tuition.

Student Housing

Campus housing is available to female graduate students on a first-come, first-serve basis. Those students interested in campus housing should contact the Director of Residence Life at 610-606-4666, ext. 3351.

Financial Aid

Students accepted to the Master of Science in Forensic Science Program may apply for graduate level federal Stafford Loans. Please contact Student Financial Services at 610-606-4602 for more information.

For Additional Information contact:

The Forensic Science Program
Phone: 610-606-4661 or Email: graduate@cedarcrest.edu

About Cedar Crest College

Founded in 1867, Cedar Crest College is located in a suburban, park-like setting in Allentown, Pennsylvania. U.S. News & World Report ranked Cedar Crest College among the Top 10 Comprehensive Colleges in the North. The magazine also listed the College as a “best value.”

Cedar Crest College complies with all applicable federal and state legislation and does not discriminate in education programs or in employment on the basis of race, religion, national origin, age, gender, disability, or sexual orientation.