A motionless man lies in a bathtub, head lolling to the side, a gash across his chest dripping blood. His right arm hangs limply, hand loosely gripping a feather quill. His left hand holds a mysterious letter. On the floor is a bone-handled knife with what appears to be a bloodstained blade.

This isn’t a fresh corpse, though; the victim was assassinated more than 200 years ago. He was radical journalist Jean-Paul Marat, killed in 1793 during the French Revolution, and his murder scene is depicted in the painting *Death of Marat* by Jacques-Louis David. A large reproduction of the image hangs in a classroom at the University of Baltimore, and Charles Tumosa, a lecturer in the Forensic Studies program, is demonstrating how to analyze the work as a crime scene.

“Let’s figure out exactly what happened here,” he begins. Tumosa knows his crime scenes: He worked as a police forensics expert in Philadelphia from 1971-89. He also has extensive experience piecing together a story from available clues, thanks to nearly 16 subsequent years of investigative work at the Smithsonian Center for Materials Research and Education.

Now, at UB, he has combined these professional skills with his interest in art to develop the courses Forensics and Art and Introduction to Document Examination, in which he and his students survey and investigate the multibillion-dollar world of art theft, forgery and insurance fraud and also use various tools to help determine provenance, authenticity and ownership.

“Good investigational skills and analytical abilities can be used in almost any intellectual pursuit, including the study of art and its associated issues,” says Tumosa, who lectures worldwide and contributes information and expertise to a variety of cases involving works of art. “What I’ve done most of my life is to solve problems. And a painting can be analyzed just like a blood spatter from a crime scene can.”

Art is big business, Tumosa says, noting that the global market tops $25 billion and that the late Thomas Hoving, former head of the Metropolitan Museum of Art, once estimated more than 20 percent of the art in circulation is made up of forgeries. As they joke in the industry, Tumosa says, Jean-Baptiste-Camille Corot produced 3,000 paintings, and 6,000 of them are in the United States.

In UB’s forensics laboratory (built in 2008 to the specs of the Baltimore Police Department to serve as their backup facility), Tumosa deploys a wide variety of technologies—including state-of-the-art microscopy, infrared analysis and other analytical tools—to reveal information about the age and composition of works of art and the materials used to produce them. Students learn about isolating one color in a Jackson Pollack abstract painting to reveal how the paint was spilled or dropped, and they can ultra-magnify a fiber scrap or paint chip.

“Becoming more proficient in art analysis involves experimentation, familiarity and gaining knowledge of things like fundamental properties of liquids,” Tumosa explains. “For instance, microscopy is recognition. If you can recognize your relatives, you can learn to recognize similar particles of paint.”

He and his students consider questions such as the path a piece of art has taken—where it came from, how it got to where it is—to evaluate authenticity and ownership. They examine techniques such as brushstrokes and toolmarks to determine whether or not the work is consistent with an artist or time period. To understand insurance fraud cases, they study whether damage to a piece of art is supported by what supposedly happened to it. Tumosa calls it “reconstructing the murder of the artwork.”
The idea behind the program is that forensic studies can apply to a wide variety of fields,” he says. “Students can search for and find opportunities in areas that aren’t well trod.”

Prior to becoming a UB faculty member, Tumosa had a varied career that began in a chemistry lab after he earned a Ph.D. in the subject from Virginia Polytechnic Institute.

Following his graduate studies, Tumosa supervised the Criminalistics Laboratory of the Philadelphia Police Department. During his 18 years there, he worked on more than 4,000 homicides and testified in more than 800 criminal cases.

“I had the greatest seat in the biggest circus in the world,” he recalls. “It was stressful; we used to say we see people on the worst day of their lives. In one case, this fellow had killed his girlfriend, and when the body was found two weeks later, he’d repainted the room where she died. So—this was pre-DNA testing—we had to remove all the paint, find where droplets of blood were and then extract bone marrow to match her blood type.”

In his years at the Smithsonian, Tumosa conducted analyses of artifacts including the Enola Gay, the aircraft that dropped the atomic bomb on Hiroshima; the Statue of Columbia on the dome of the U.S. Capitol; and a time capsule from evolutionary science Charles Darwin’s ship, the HMS Beagle.

His research provided insights into areas such as conservation, anthropology and the mechanisms of ancient technology.

“I’ve been very fortunate to be able to see and work with some amazing things—the Monroe Doctrine, the Star-Spangled Banner (the actual flag), the contents of Abraham Lincoln’s pockets the night he was assassinated,” he says. “To be able to get close to those things, put your nose to them, so to speak, that’s kind of neat.”

In the Forensic Studies program, Tumosa and his colleagues mentor students in real-world forensic science training, including working with Baltimore city police officers and analyzing evidence in UB’s forensics, microscopy and crime scene laboratories.

“I love to observe students as they get that lightbulb moment,” he says. “If you study history as I do, you realize that along the way, you never know whom you’re going to influence.”

Currently, Tumosa is developing a new course, Chemistry of Death. “It’s about what happens before death, at the moment of death and as bodies go back to dust,” he explains. “It seems like a perfect match to unraveling the Death of Marat. In his lecture, Tumosa points out the direction the blood is flowing; that there is money left on the table, so the painting does not reflect a robbery; that the documents on the table are warrants; and that the letter in Marat’s hand contains the name of his murderer, Charlotte Corday, who blamed Marat for inciting violence that she feared would lead to civil war in France. “Fitting together different aspects of what you see here,” he concludes, “we can do a pretty good job of reconstructing this crime.”

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Death of Marat, An Autopsy

Charles Tumosa, a lecturer who teaches the course Forensics and Art at UB, shares an analytical explanation of what’s revealed in Jacques-Louis David’s painting Death of Marat, which adorns a wall in one of the University’s forensic labs.

True Forensic Story: Nabbing Elusive Art Forgers

One of the most prolific and successful art forgers in recent history, Sean Greenhalgh produced his works in a garden shed behind a British council house, a type of public housing. Greenhalgh, who lived with his parents, created fakes ranging from sketches and paintings to silver chalices and Egyptian statuary and sold them for more than 1.5 million pounds (almost $800,000 in 2003). Vernon Rapley, the head of Scotland Yard’s Arts and Antiques Unit who cracked the Greenhalgh case, called him the world’s “most diverse” art forger.

Greenhalgh, it was revealed at his trial, was shy and did not like to interact with potential buyers, so his mother, Olive, and his father, George, served as his front men. They would approach art experts at prominent museums and auction houses with sample pieces that they claimed were family heirlooms. Some of Greenhalgh’s most successful forgeries include The Faun, a ceramic sculpture falsely attributed to Paul Gauguin and purchased by the Art Institute of Chicago for $225,000 in 1977; and the Amarna Princess, a 20-inch “alabaster” statuette (the work was actually made of calcite, which Greenhalgh coated with tea and clay to give it an aged appearance) purported to portray the mother of King Tutankhamun, bought by the United Kingdom’s Bolton Museum for more than $800,000 in 2003.

The police apprehended the Greenhalghs when their faked marble reliefs, authenticated by the British Museum to date from 600 B.C., were examined by another expert who noticed anomalies like a spelling mistake in the cuneiform script. Sean Greenhalgh, now 50, was sentenced to five years in prison in 2006. His parents, 86 and 88, received suspended sentences.

Death warrants under Marat’s hand: This is where a little bit of history comes in. Tumosa explains that Marat was a revolutionary in the French Revolution, and he was having anyone who displayed anti-Revolution sentiments killed by the authorities. The quilt in his hand shows that he’d been signing those very death warrants. 800 criminal cases.

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