SANS Baltimore 2016

October 10-15

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"This SANS course was tremendously timely and super relevant for my career!"
-James Miller,
SRA International

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See page 13 for more details.

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SANS Instructors

SANS instructors are real-world practitioners who specialize in the subjects they teach. All instructors undergo rigorous training and testing in order to teach SANS courses. This guarantees that what you learn in class will be up to date and relevant to your job. The SANS Baltimore 2016 lineup of instructors includes:

Mark Bristow
SANS Instructor
@kodefupanda

Rebekah Brown
SANS Instructor
@PDXBek

Kevin Fiscus
Certified Instructor
@kevinbfiscus

Paul A. Henry
Senior Instructor
@phenrycissp

Micah Hoffman
Certified Instructor
@WebBreacher

Robert M. Lee
Certified Instructor
@RobertMLee

Heather Mahalik
Senior Instructor
@HeatherMahalik

Jeff McJunkin
SANS Instructor
@jeffmcjunkin

Hal Pomeranz
Faculty Fellow
@hal_pomeranz

Bryan Simon
Certified Instructor
@BryanOnSecurity

Mark Williams
SANS Instructor
@securemdw

Eric Zimmerman
SANS Instructor
@EricRZimmerman

Evening Bonus Sessions

Take advantage of these extra evening presentations and add more value to your training. Learn more on page 11.

KEYNOTE: ***Evolving Threats*** – Paul A. Henry

Women's CONNECT Event

Continuous Ownage: Why You Need Continuous Monitoring – Bryan Simon

Running Away from Security: Web App Vulnerabilities and OSINT Collide – Micah Hoffman

(Am)Cache Rules Everything Around Me – Eric Zimmerman

DLP FAIL!!! Using Encoding, Steganography, and Covert Channels to Evade DLP and Other Critical Controls – Kevin Fiscus

Be sure to register and pay by August 17th for a $400 tuition discount!

Courses-at-a-Glance

Register today for SANS Baltimore 2016!
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#SANSBaltimore

SEC401:
Security Essentials Bootcamp Style

SANS

Six-Day Program
Mon, Oct 10 - Sat, Oct 15
9:00am - 7:00pm (Days 1-5)
9:00am - 5:00pm (Day 6)
46 CPEs
Laptop Required
Instructor: Bryan Simon

www.giac.org/gsec

www.sans.edu

www.sans.org/cyber-guardian

www.sans.org/8140

BUNDLE ONDEMAND
WITH THIS COURSE
www.sans.org/ondemand

"The instructor did a really awesome job with crypto. It was the best explanation I have heard without overloading on tech jargon."
-Mike Lawrence, Protiviti

Learn the most effective steps to prevent attacks and detect adversaries with actionable techniques that you can directly apply when you get back to work. Learn tips and tricks from the experts so that you can win the battle against the wide range of cyber adversaries that want to harm your environment.

Learn to build a security roadmap that can scale today and into the future.

SEC401: Security Essentials Bootcamp Style is focused on teaching you the essential information security skills and techniques you need to protect and secure your organization's critical information assets and business systems. This course will show you how to prevent your organization's security problems from being headline news in the *Wall Street Journal*!

Who Should Attend

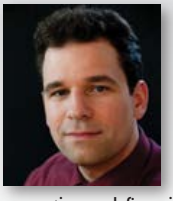
- Security professionals who want to fill the gaps in their understanding of technical information security
- Managers who want to understand information security beyond simple terminology and concepts
- Operations personnel who do not have security as their primary job function but need an understanding of security to be effective
- IT engineers and supervisors who need to know how to build a defensible network against attacks
- Forensic analysts, penetration testers, and auditors who need a solid foundation of security principles so they can be as effective as possible at their jobs
- Anyone new to information security with some background in information systems and networking

With the rise of advanced persistent threats, it is almost inevitable that organizations will be targeted. Whether the attacker is successful in penetrating an organization's network depends on the effectiveness of the organization's defense. Defending against attacks is an ongoing challenge, with new threats emerging all of the time, including the next generation of threats. Organizations need to understand what really works in cybersecurity. What has worked, and will always work, is taking a risk-based approach to cyber defense. Before your organization spends a dollar of its IT budget or allocates any resources or time to anything in the name of cybersecurity, three questions must be answered:

- What is the risk?
- Is it the highest priority risk?
- What is the most cost-effective way to reduce the risk?

Security is all about making sure you focus on the right areas of defense. In SEC401 you will learn the language and underlying theory of computer and information security. You will gain the essential and effective security knowledge you'll need if you are given the responsibility for securing systems and/or organizations. This course meets both of the key promises SANS makes to our students: (1) You will learn up-to-the-minute skills you can put into practice immediately upon returning to work; and (2) You will be taught by the best security instructors in the industry.

PREVENTION IS IDEAL BUT DETECTION IS A MUST.



Bryan Simon *SANS Certified Instructor*

Bryan Simon is an internationally recognized expert in cybersecurity and has been working in the information technology and security field since 1991. Over the course of his career, Bryan has held various technical and managerial positions in the education, environmental, accounting, and financial services sectors. Bryan speaks on a regular basis at international conferences and with the press on matters of cybersecurity. He has instructed individuals from organizations such as the FBI, NATO, and the UN in matters of cybersecurity, on two continents. Bryan has specialized expertise in defensive and offensive capabilities. He has received recognition for his work in IT security, and was most recently profiled by McAfee (part of Intel Security) as an IT Hero. Bryan holds 11 GIAC certifications including GSEC, GCWN, GCIH, GCFA, GPEN, GWAPT, GAWN, GISP, GCIA, GCED, and GCUX. Bryan's scholastic achievements have resulted in the honor of sitting as a current member of the Advisory Board for the SANS Institute, and his acceptance into the prestigious SANS Cyber Guardian program. Bryan is a SANS instructor for SEC401, SEC501, SEC505, and SEC511. @BryanOnSecurity

SEC501:

Advanced Security Essentials – Enterprise Defender

SANS

Six-Day Program
Mon, Oct 10 - Sat, Oct 15
9:00am - 5:00pm
Laptop Required
36 CPEs
Instructor: Paul A. Henry

www.giac.org/gced

SANS Technology Institute
www.sans.edu

www.sans.org/8140

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with this course
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"SEC501 is a must for cybersecurity professionals!"
-Gary Oakley, Bechtel Marine Propulsion Corporation

Effective cybersecurity is more important than ever as attacks become stealthier, have a greater financial impact, and cause broad reputational damage. **SEC501: Advanced Security Essentials – Enterprise Defender** builds on a solid foundation of core policies and practices to enable security teams to defend their enterprise.

Who Should Attend

- Incident response and penetration testers
- Security Operations Center engineers and analysts
- Network security professionals
- Anyone who seeks technical in-depth knowledge about implementing comprehensive security solutions

It has been said of security that "prevention is ideal, but detection is a must." However, detection without response has little value. Network security needs to be constantly improved to prevent as many attacks as possible and to swiftly detect and respond appropriately to any breach that does occur. This PREVENT – DETECT – RESPONSE strategy must be in place both externally and internally. As data become more portable and networks continue to be porous, there needs to be an increased focus on data protection. Critical information must be secured regardless of whether it resides on a server, in a robust network architecture, or on a portable device.

"This training will help me greatly to advance my career in a DoD IT cybersecurity position as an ISSO."
-Yvonne E. DoD AFN-BC

Of course, despite an organization's best efforts to prevent network attacks and protect its critical data, some attacks will still be successful. Therefore, organizations need to be able to detect attacks in a timely fashion. This is accomplished by understanding the traffic that is flowing on your networks, looking for indications of an attack, and performing penetration testing and vulnerability analysis against your organization to identify problems and issues before a compromise occurs.

Finally, once an attack is detected we must react quickly and effectively and perform the forensics required. Knowledge gained by understanding how the attacker broke in can be fed back into more effective and robust prevention and detection measures, completing the security lifecycle.

Paul A. Henry *SANS Senior Instructor*

Paul is one of the world's foremost global information security and computer forensic experts, with more than 20 years' experience managing security initiatives for Global 2000 enterprises and government organizations worldwide. Paul is a principal at vNet Security, LLC and is keeping a finger on the pulse of network security as the security and forensic analyst at Lumension Security. Throughout his career, Paul has played a key strategic role in launching new network security initiatives to meet our ever-changing threat landscape. He also advises and consults on some of the world's most challenging and high-risk information security projects, including the National Banking System in Saudi Arabia, the Reserve Bank of Australia, the U.S. Department of Defense's Satellite Data Project, and both government and telecommunications projects throughout Southeast Asia. Paul is frequently cited by major publications as an expert on perimeter security, incident response, computer forensics, and general security trends, and serves as an expert commentator for network broadcast outlets such as FOX, NBC, CNN, and CNBC. In addition, Paul regularly authors thought leadership articles on technical security issues, and his expertise and insight help shape the editorial direction of key security publications such as the *Information Security Management Handbook*, to which he is a consistent contributor. Paul is a featured speaker at seminars and conferences worldwide, delivering presentations on diverse topics such as anti-forensics, network access control, cyber crime, DDoS attack risk mitigation, perimeter security, and incident response. @phenrycissp

SEC504:

Hacker Tools, Techniques, Exploits, and Incident Handling

SANS

Six-Day Program
Mon, Oct 10 - Sat, Oct 15
9:00am - 7:15pm (Day 1)
9:00am - 5:00pm (Days 2-6)
37 CPEs
Laptop Required
Instructor: Kevin Fiscus

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"This was an extremely engaging course that highlights new ways of looking into incident response."
-Ryan Guest, Southern Company

The Internet is full of powerful hacking tools and bad guys using them extensively. If your organization has an Internet connection or one or two disgruntled employees (and whose does not!), your computer systems will get attacked. From the five, ten, or even one hundred daily probes against your Internet infrastructure to the malicious insider slowly creeping through your most vital information assets, attackers are targeting your systems with increasing viciousness and stealth. **As defenders, it is essential we understand these hacking tools and techniques.**

Who Should Attend

- Incident handlers
- Leaders of incident handling teams
- System administrators who are on the front lines defending their systems and responding to attacks
- Other security personnel who are first responders when systems come under attack

"SEC504 teaches you methods for testing your defenses and how to identify weaknesses in your network and systems."
-Rene Graf, Federal Home Loan Bank

This course enables you to turn the tables on computer attackers by helping you understand their tactics and strategies in detail, giving you hands-on experience in finding vulnerabilities and discovering intrusions, and equipping you with a comprehensive incident handling plan. It addresses the latest cutting-edge insidious attack vectors, the "oldie-but-goodie" attacks that are still prevalent, and everything in between. **Instead of merely teaching a few hack attack tricks, this course provides a time-tested, step-by-step process for responding to computer incidents, and a detailed description of how attackers undermine systems so you can prepare for, detect, and respond to attacks.** In addition, the course explores the legal issues associated with responding to computer attacks, including employee monitoring, working with law enforcement, and handling evidence. Finally, students will participate in a **hands-on** workshop that focuses on scanning for, exploiting, and defending systems. This will enable you to discover the holes in your system before the bad guys do!

The course is particularly well-suited to individuals who lead or are a part of an incident handling team. **General security practitioners, system administrators, and security architects will benefit by understanding how to design, build, and operate their systems to prevent, detect, and respond to attacks.**

"This course provides an eye-opening overview of methods and tools used by bad actors as well as a good explanation of incident handling processes!"
-Steven J. Sparks, Honeywell

Kevin Fiscus *SANS Certified Instructor*

Kevin Fiscus is the founder of and lead consultant for Cyber Defense Advisors, where he performs security and risk assessments, vulnerability and penetration testing, security program design, policy development and security awareness with a focus on serving the needs of small and mid-sized organizations. Kevin has over 20 years of IT experience and has focused exclusively for the past 12 years on information security. Kevin currently holds the CISA, GPEN, GREM, GMOB, GCED, GCFA-Gold, GCIA-Gold, GCIH, GAWN, GPPA, GCWN, GCSC-Gold, GSEC, SCSA, RCSE, and SnortCP certifications and is proud to have earned the top information security certification in the industry, the GIAC Security Expert. Kevin has also achieved the distinctive title of SANS Cyber Guardian for both red team and blue team. @kevinbfiscus

SEC542:

Web App Penetration Testing and Ethical Hacking

SANS

Six-Day Program
Mon, Oct 10 - Sat, Oct 15
9:00am - 5:00pm
36 CPEs
Laptop Required
Instructor: Micah Hoffman

Web applications play a vital role in every modern organization. But if your organization does not properly **test** and **secure** its web apps, adversaries can compromise these applications, damage business functionality, and steal data. Unfortunately, many organizations operate under the mistaken impression that a web application security scanner will reliably discover flaws in their systems.

Who Should Attend

- General security practitioners
- Penetration testers
- Ethical hackers
- Web application developers
- Website designers and architects

Customers expect web applications to provide significant functionality and data access. Even beyond the importance of customer-facing web applications, internal web applications increasingly represent the most commonly used business tools within any organization. **Unfortunately, there is no "patch Tuesday" for custom web applications, so major industry studies find that web application flaws play a major role in significant breaches and intrusions.** Adversaries increasingly focus on these high-value targets either by directly abusing public-facing applications or by focusing on web apps as targets after an initial break-in.

"As a web application developer, this course gives great insight into what I can do better and what to look for." -Joshua Barone, GEOCENT

Modern cyber defense requires a realistic and thorough understanding of web application security issues. Anyone can learn to sling a few web hacks, but effective web application penetration testing requires something deeper.

Students will come to understand major web application flaws and their exploitation and, most importantly, learn a field-tested and repeatable process to consistently find these flaws and convey what they have learned to their organizations. Even technically gifted security geeks often struggle with helping organizations understand risk in terms relatable to business. Much of the art of penetration testing has less to do with learning how adversaries are breaking in than it does with convincing an organization to take the risk seriously and employ appropriate countermeasures. The goal of SEC542 is to better secure organizations through penetration testing, and not just show off hacking skills. The course will help you demonstrate the true impact of web application flaws through exploitation.

In addition to more than 30 formal hands-on labs, the course culminates in a web application pen test tournament, powered by the SANS NetWars Cyber Range. **This Capture-the-Flag event on the final day brings students into teams to apply their newly acquired command of web application penetration testing techniques in a fun way to hammer home lessons learned.**

www.giac.org/gwapt

www.sans.edu

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"(Day 6) Capture the Flag was an amazing eye opener to the real world of web pen testing."
-Derick Ansignia, Scarfold Consult

Micah Hoffman *SANS Certified Instructor*

Micah Hoffman has been working in the information technology field since 1998 supporting federal government and commercial customers in their efforts to discover and quantify information security weaknesses within their organizations. He leverages years of hands-on, real-world penetration testing and incident response experience to provide excellent solutions to his customers. Micah holds the GMON, GAWN, GWAPT, and GPEN certifications as well as the CISSP. Micah is an active member in the NoVAHackers community, writes Recon-ng modules and enjoys tackling issues with the Python scripting language. When not working, teaching, or learning, Micah can be found hiking or backpacking on the Appalachian Trail or the many park trails in Maryland. @WebBreacher

SEC560:

Network Penetration Testing and Ethical Hacking

SANS

Six-Day Program
Mon, Oct 10 - Sat, Oct 15
9:00am - 7:15pm (Day 1)
9:00am - 5:00pm (Days 2-6)
37 CPEs
Laptop Required
Instructor: Jeff McJunkin

www.giac.org/gpen

www.sans.edu

www.sans.org/cyber-guardian

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with this course
www.sans.org/ondemand

"This course pulls together all of the tools needed for pen testing in a very clear and logical manner. SEC560 is excellent and highly valuable training!"
-Bill Hinds,
Project Management Institute

As a cybersecurity professional, you have a unique responsibility to find and understand your organization's vulnerabilities, and to work diligently to mitigate them before the bad guys pounce. Are you ready? SANS SEC560, our flagship course for penetration testing, fully arms you to address this task head-on.

With comprehensive coverage of tools, techniques, and methodologies for network penetration testing, SEC560 truly prepares you to conduct high-value penetration testing projects step-by-step and end-to-end. Every organization needs skilled information security personnel who can find vulnerabilities and mitigate their effects, and this entire course is specially designed to get you ready for that role. The course starts with proper planning, scoping and recon, then dives deep into scanning, target exploitation, password attacks, and web app manipulation, with **over 30 detailed hands-on labs** throughout. The course is chock full of practical, real-world tips from some of the world's best penetration testers to help you do your job safely, efficiently…and masterfully.

SEC560 is designed to get you ready to conduct a full-scale, high-value penetration test – and on the last day of the course you'll do just that. After building your skills in comprehensive and challenging labs over five days, the course culminates with a final full-day, real-world penetration test scenario. You'll conduct an end-to-end pen test, applying knowledge, tools, and principles from throughout the course as you discover and exploit vulnerabilities in a realistic sample target organization, demonstrating the knowledge you've mastered in this course.

You will learn how to perform detailed reconnaissance, studying a target's infrastructure by mining blogs, search engines, social networking sites, and other Internet and intranet infrastructures. Our hands-on labs will equip you to scan target networks using best-of-breed tools. We won't just cover run-of-the-mill options and configurations, we'll also go over the lesser-known but super-useful capabilities of the best pen test toolsets available today. After scanning, you'll learn dozens of methods for exploiting target systems to gain access and measure real business risk. **You'll dive deep into post-exploitation, password attacks, and web apps, pivoting through the target environment to model the attacks of real-world bad guys to emphasize the importance of defense in depth.**

Who Should Attend

- Security personnel whose job involves assessing networks and systems to find and remediate vulnerabilities
- Penetration testers
- Ethical hackers
- Defenders who want to better understand offensive methodologies, tools, and techniques
- Auditors who need to build deeper technical skills
- Red and blue team members
- Forensics specialists who want to better understand offensive tactics

Jeff McJunkin *SANS Instructor*

Jeff McJunkin is a senior staff member at Counter Hack Challenges with more than nine years of experience in systems and network administration and network security. His greatest strength is his breadth of experience - from network and web application penetration testing to digital/mobile forensics, and from technical training to systems architecture. Jeff is a computer security/information assurance graduate of Southern Oregon University and holds many professional certifications. He has also competed in many security competitions, including taking first place at a regional NetWars competition and a U.S. Cyber Challenge capture-the-flag competition, as well as joining the Red Team for the Pacific Rim Collegiate Cyber Defense Competition. His personal blog can be found at http://jeffmcjunkin.com. @jeffmcjunkin

FOR508:

Advanced Digital Forensics and Incident Response

SANS

Six-Day Program
Mon, Oct 10 - Sat, Oct 15
9:00am - 5:00pm
36 CPEs
Laptop Required
Instructors: Hal Pomeranz, Eric Zimmerman

www.giac.org/gcfa

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www.sans.org/cyber-guardian

www.sans.org/8140

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FOR508: Advanced Digital Forensics and Incident Response will help you determine:

- How the breach occurred
- How systems were affected and compromised
- What attackers took or changed
- How to contain and mitigate the incident

DAY 0: A 3-letter government agency contacts you to say critical information was stolen through a targeted attack on your organization. They won't tell how they know, but they identify several breached systems within your enterprise. An advanced persistent threat adversary, aka an APT, is likely involved – the most sophisticated threat you are likely to face in your efforts to defend your systems and data.

Who Should Attend

- Incident response team leaders and members
- Security Operations Center personnel and information security practitioners
- Experienced digital forensic analysts
- System administrators
- Federal agents and law enforcement
- Red team members, penetration testers, and exploit developers
- SANS FOR408 and SEC504 graduates

Over 80% of all breach victims learn of a compromise from third-party notifications, not from internal security teams. In most cases, adversaries have been rummaging through your network undetected for months or even years.

"Traditional knowledge is useful, but this course provided the practical side of a growing trend." -Erik M., Arkansas State Police

Incident response tactics and procedures have evolved rapidly over the past several years. Data breaches and intrusions are growing more complex. Adversaries are no longer compromising one or two systems in your enterprise; they are compromising hundreds. Your team can no longer afford antiquated incident response techniques that fail to properly identify compromised systems, provide ineffective containment of the breach, and ultimately fail to rapidly remediate the incident.

This in-depth incident response course provides responders with advanced skills to hunt down, counter, and recover from a wide range of threats within enterprise networks, including APT adversaries, organized crime syndicates, and hactivism. Constantly updated, FOR508 addresses today's incidents by providing hands-on incident response tactics and techniques that elite responders are successfully using in real-world breach cases.

GATHER YOUR INCIDENT RESPONSE TEAM – IT'S TIME TO GO HUNTING!

Hal Pomeranz *SANS Faculty Fellow*
Hal Pomeranz is an independent digital forensic investigator who has consulted on cases ranging from intellectual property theft to employee sabotage, organized cybercrime, and malicious software infrastructure. He has worked with law enforcement agencies in the United States and Europe and with global corporations. While equally at home in the Windows or Mac environment, Hal is recognized as an expert in the analysis of Linux and Unix systems. His research on EXT4 file system forensics provided a basis for the development of open-source forensic support for this file system. His EXT3 file recovery tools are used by investigators worldwide. Hal is the co-author of the Command Line Kung Fu blog. @hal_pomeranz

Eric Zimmerman *SANS Instructor*
Eric Zimmerman is a senior director in Kroll's Cyber Security and Investigations practice. Eric has tremendous depth and breadth of expertise in the cyber realm, spanning complex law enforcement investigations, computer forensics, expert witness testimony, computer systems design, and application architecture. He has received numerous awards for his work, is an award-winning author, and is a frequently sought-after instructor and presenter on cyber-related topics. @EricRZimmerman

FOR578:
Cyber Threat Intelligence

NEW

SANS

Five-Day Program
Mon, Oct 10 - Fri, Oct 14
9:00am - 5:00pm
30 CPEs
Laptop Required
Instructors: Rebekah Brown, Robert M. Lee

Make no mistake: current computer network defense and incident response contain a strong element of intelligence and counterintelligence that analysts must understand and leverage in order to defend their computers, networks, and proprietary data.

FOR578: Cyber Threat Intelligence will help network defenders and incident responders:

- Construct and exploit threat intelligence to detect, respond to, and defeat advanced persistent threats (APTs)
- Fully analyze successful and unsuccessful intrusions by advanced attackers
- Piece together intrusion campaigns, threat actors, and nation-state organizations
- Manage, share, and receive intelligence on APT adversary groups
- Generate intelligence from their own data sources and share it accordingly
- Identify, extract, and leverage intelligence from APT intrusions
- Expand upon existing intelligence to build profiles of adversary groups
- Leverage intelligence to better defend against and respond to future intrusions

Conventional network defenses such as intrusion detection systems and anti-virus tools focus on the vulnerability component of risk, and traditional incident response methodology pre-supposes a successful intrusion. However, the evolving sophistication of computer network intrusions has rendered these approaches insufficient to address the threats faced by modern networked organizations. Today's adversaries accomplish their goals using advanced tools and techniques designed to circumvent most conventional computer network defense mechanisms, go undetected during the intrusion, and then remain undetected on networks over long periods of time.

The collection, classification, and exploitation of knowledge about adversaries – collectively known as cyber threat intelligence – gives network defenders information superiority that can be used to reduce the adversary's likelihood of success with each subsequent intrusion attempt. Responders need accurate, timely, and detailed information to monitor new and evolving attacks, as well as methods to exploit this information to put in place an improved defensive posture. Threat intelligence thus represents a force multiplier for organizations looking to update their response and detection programs to deal with increasingly sophisticated advanced persistent threats.

During a targeted attack, an organization needs a top-notch and cutting-edge incident response team armed with the critical intelligence necessary to understand how adversaries operate and to combat the threat. FOR578 will train you and your team to detect, scope, and select resilient courses of action in response to such intrusions and data breaches.

THERE IS NO TEACHER BUT THE ENEMY!

Who Should Attend

- Incident response team members
- Security Operations Center personnel and information security practitioners
- Experienced digital forensic analysts
- Federal agents and law enforcement officials
- SANS FOR408, FOR572, FOR508, or FOR610 graduates looking to take their skills to the next level

"Threat intel is something new that most don't understand. This course helped me understand those threats!"
-Anja, Nationstar Mortgage

Rebekah Brown *SANS Instructor*

Rebekah Brown is the threat intelligence lead for Rapid7, supporting incident response, analytic response, global services and product support. She is a former NSA network warfare analyst, U.S. Cyber Command training and exercise lead, and Marine Corps crypto-linguist who has helped develop threat intelligence programs at the federal, state, and local levels as well as in the private sector at a Fortune 500 company. She has an associate degree in Chinese Mandarin, a B.A. in international relations, and is wrapping up a M.A in homeland security with a cybersecurity focus and a graduate certificate in intelligence analysis. @PDXBek

Robert M. Lee *SANS Certified Instructor*

Robert M. Lee is the CEO and founder of the critical infrastructure cybersecurity company Dragos Security LLC, where he has a passion for control system traffic analysis, incident response, and threat intelligence research. He is the course author of SANS ICS515 and FOR578. Robert is also a non-resident National Cyber Security Fellow at New America focusing on policy issues relating to the cybersecurity of critical infrastructure and a PhD candidate at Kings College London. He was named one of Passcode's Influencers and awarded EnergySec's 2015 Cyber Security Professional of the Year. @RobertMLee

FOR585:
Advanced Smartphone Forensics

SANS

Six-Day Program
Mon, Oct 10 - Sat, Oct 15
9:00am - 5:00pm
36 CPEs
Laptop Required
Instructor: Heather Mahalik

www.giac.org/gasf

www.sans.edu

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with this course
www.sans.org/ondemand

"The analyses and methodologies taught in FOR585 will enable examiners to methodically locate files of interest and then quickly analyze them for evidence of interest."
-Sandy Osborne, SAVA Workforce Solutions

Mobile devices are often a key factor in criminal cases, intrusions, IP theft, security threats, and more. Understanding how to leverage the data from the device in a correct manner can make or break your case and your future as an expert. **FOR585: Advanced Smartphone Forensics** will teach you those skills.

Every time the smartphone "thinks" or makes a suggestion, the data are saved. It's easy to get mixed up in what the forensic tools are reporting. Smartphone forensics is more than pressing the "find evidence" button and getting answers. Your team cannot afford to rely solely on the tools in your lab. You have to understand how to use them correctly to guide your investigation, instead of just letting the tool report what it believes happened on the device. It is impossible for commercial tools to parse everything from smartphones and understand how the data were put on the device. Examining and interpreting the data is your job, and this course will provide you and your organization with the capability to find and extract the correct evidence from smartphones with confidence.

Who Should Attend

- Experienced digital forensic analysts
- Media exploitation analysts
- Information security professionals
- Incident response teams
- Law enforcement officers, federal agents, and detectives
- IT auditors
- SANS SEC575, FOR408, FOR508, FOR518, and FOR572 graduates looking to take their skills to the next level

This in-depth smartphone forensic course provides examiners and investigators with advanced skills to detect, decode, decrypt, and correctly interpret evidence recovered from mobile devices. The course features 17 hands-on labs that allow students to analyze different datasets from smart devices and leverage the best forensic tools and custom scripts to learn how smartphone data hide and can be easily misinterpreted by forensic tools. Each lab is designed to teach you a lesson that can be applied to other smartphones. You will gain experience with the different data formats on multiple platforms and learn how the data are stored and encoded on each type of smart device. The labs will open your eyes to what you are missing by relying 100% on your forensic tools.

FOR585 is continuously updated to keep up with the latest malware, smartphone operating systems, third-party applications, and encryption. This intensive six-day course offers the most unique and current instruction available, and it will arm you with mobile device forensic knowledge you can apply immediately to cases you're working on the day you leave the course.

Smartphone technologies are constantly changing, and most forensic professionals are unfamiliar with the data formats for each technology. Take your skills to the next level: it's time for the good guys to get smarter and for the bad guys to know that their texts and apps can and will be used against them!

SMARTPHONE DATA CAN'T HIDE FOREVER – IT'S TIME TO OUTSMART THE MOBILE DEVICE!

Heather Mahalik *SANS Senior Instructor*

Heather Mahalik is leading the forensic effort as a Principal Forensic Scientist and Team Lead for Oceans Edge, Inc. Heather has over 12 years of experience in digital forensics, vulnerability discovery of mobile devices, application reverse engineering and manual decoding. She is currently the course lead for FOR585: Advanced Smartphone Forensics. Previously, Heather headed the mobile device team for Basis Technology, where she led the mobile device exploitation efforts in support of the U.S. government. She also worked as a forensic examiner at Stroz Friedberg and the U.S. State Department Computer Investigations and Forensics Lab, where she focused on high-profile cases. Heather co-authored Practical Mobile Forensics and various white papers, and has presented at leading conferences and instructed classes focused on Mac forensics, mobile device forensics, and computer forensics to practitioners in the field. Heather blogs and hosts work from the digital forensics community at www.smarterforensics.com. @HeatherMahalik

MGT514:

IT Security Strategic Planning, Policy, and Leadership

SANS

Five-Day Program
Mon, Oct 10 - Fri, Oct 14
9:00am - 5:00pm
30 CPEs
Laptop NOT Needed
Instructor: Mark Williams

SANS Technology Institute
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"This is a great foundational course as we realize the importance of bringing a business perspective to security."
-Nairobi Kim, Wells Fargo

"The balance is great and the full policy in the appendix helped to round out the analysis. The policy discussions and slides were quite helpful."
-Jason Popp, Nordstrom Inc.

As security professionals we have seen the landscape change. Cybersecurity is now more vital and relevant to the growth of your organization than ever before. As a result, information security teams have more visibility, more budget, and more opportunity. However, with this increased responsibility comes more scrutiny.

This course teaches security professionals how to do three things:

Who Should Attend

- CISOs
- Information security officers
- Security directors
- Security managers
- Aspiring security leaders
- Other security personnel who have team-lead or management responsibilities

Develop Strategic Plans

Strategic planning is hard for people in IT and IT security because we spend so much time responding and reacting. We almost never get to practice until we get promoted to a senior position and then we are not equipped with the skills we need to run with the pack. Learn how to develop strategic plans that resonate with other IT and business leaders.

Create Effective Information Security Policy

Policy is a manager's opportunity to express expectations for the workforce, set the boundaries of acceptable behavior, and empower people to do what they ought to be doing. It is easy to get wrong. Have you ever seen a policy and your response was, "No way, I am not going to do that?" Policy must be aligned with an organization's culture. We will break down the steps to policy development so that you have the ability to develop and assess policy to successfully guide your organization.

Develop Management and Leadership Skills

Leadership is a capability that must be learned, exercised and developed to better ensure organizational success. Strong leadership is brought about primarily through selfless devotion to the organization and staff, tireless effort in setting the example, and the vision to see and effectively use available resources toward the end goal. Effective leadership entails persuading team members to accomplish their objectives while removing obstacles and maintaining the well-being of the team in support of the organization's mission. Learn to utilize management tools and frameworks to better lead, inspire, and motivate your teams.

"Mark did a great job engaging the students. This was a tough course, however, he pulled participation out of everyone." -Todd Wagner, Caterpillar

Mark Williams *SANS Instructor*

Mark Williams currently holds the position of Principal Systems Security Officer at BlueCross BlueShield of Tennessee. Mark holds multiple certifications in security and privacy including the CISSP, CISA, CRISC, and CIPP/IT. He has authored and taught courses at undergraduate and graduate levels, as well as public seminars around the world. He has worked in public and private sectors in the Americas, Canada, and Europe in the fields of security, compliance, and management. Mark has more than 20 years of international high-tech business experience working with major multinational organizations, governments, and private firms. During his career Mark has consulted on issues of privacy and security, led seminars, and developed information security, privacy, and compliance-related programs. @securemdw

ICS515:
ICS Active Defense and Incident Response

SANS

Five-Day Program
Mon, Oct 10 - Fri, Oct 14
9:00am - 5:00pm
30 CPEs
Laptop Required
Instructor: Mark Bristow

ICS515: ICS Active Defense and Incident Response will help you deconstruct ICS cyber attacks, leverage an active defense to identify and counter threats in your ICS, and use incident response procedures to maintain the safety and reliability of operations. This course will empower students to understand their networked industrial control system environment, monitor it for threats, perform incident response against identified threats, and learn from interactions with the adversary to enhance network security. This process of monitoring, responding to, and learning from threats internal to the network is known as active defense. An active defense is the approach needed to counter advanced adversaries targeting ICS, as has been seen with malware such as Stuxnet, Havex, and BlackEnergy2. Students can expect to come out of this course with the ability to deconstruct targeted ICS attacks and fight these adversaries and others. The course uses a hands-on approach and real-world malware to break down cyber attacks on ICS from start to finish. Students will gain a practical and technical understanding of leveraging active defense concepts such as using threat intelligence, performing network security monitoring, and utilizing malware analysis and incident response to ensure the safety and reliability of operations. The strategy and technical skills presented in this course serve as a basis for ICS organizations looking to show that defense is do-able.

Who Should Attend

- ICS incident response team leads and members
- ICS and operations technology security personnel
- IT security professionals
- Security Operations Center (SOC) team leads and analysts
- ICS red team and penetration testers
- Active defenders

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"The ICS environments are unique and require specialized skills and processes to effectively manage the threats and vulnerabilities."
-John Ballentine, Ethosenergy

"This course is the missing piece to get companies to take threats seriously, pursue the truth, and share their findings."
-Rob Cantu, DOE

You Will Be Able To

- Examine ICS networks and identify the assets and their data flows in order to understand the network baseline information needed to identify advanced threats
- Use active defense concepts such as threat intelligence analysis, network security monitoring, malware analysis, and incident response to safeguard the ICS
- Build your own Programmable Logic Controller using a CYBATIworks Kit and keep it after the class ends
- Gain hands-on experience with samples of Havex, BlackEnergy2, and Stuxnet through engaging labs while de-constructing these threats and others
- Leverage technical tools such as Shodan, Security Onion, TCPDump, NetworkMiner, Foremost, Wireshark, Snort, Bro, SGUIL, ELSA, Volatility, Redline, FTK Imager, PDF analyzers, malware sandboxes, and more
- Create indicators of compromise (IOCs) in OpenIOC and YARA while understanding sharing standards such as STIX and TAXII
- Take advantage of models such as the Sliding Scale of Cybersecurity, the Active Cyber Defense Cycle, and the ICS Cyber Kill Chain to extract information from threats and use it to encourage the long-term success of ICS network security

Mark Bristow *SANS Instructor*

Mark Bristow was born to work in information security, as he found his first bug in an ICS system at the age of 10. As a teen he had a passion for technology and spent a lot of time exploring the possibilities on his computer. Once he realized he could make a career out of this passion, he jumped at the opportunity and earned a computer engineering degree from Penn State. Mark loves the ever-changing landscape of security and views it as a puzzle that must be solved. He especially loves the challenges in ICS security, as defending the systems where cyber meets physical means there is no greater success than a safe and effective process. Currently Mark is the Chief of ICS-CERT Incident Response at the Department of Homeland Security, where he leverages his expertise in incident response, industrial control systems, network monitoring and defense to support national security interests. In Mark's 12-year security career he has also worked for SRA and Securicon, where he supported a variety of private and public sector clients. @kodefupanda

SANS@NIGHT EVENING TALKS

Enrich your SANS training experience!

Evening talks by our instructors and selected subject-matter experts help you broaden your knowledge, hear from the voices that matter in computer security, and get the most for your training dollar.

KEYNOTE: **Evolving Threats** – *Paul A. Henry*

For nearly two decades, defenders have fallen into the "crowd mentality trap." They have simply settled on doing the same thing everyone else was doing, while at the same time attackers have clearly evolved both in terms of malware delivery vectors and attack methodology. Today our defenses focus primarily on the gateway and on attempting to outwit an attacker's delivery methods. This leaves us woefully exposed and according to a recent Data Breach Report has resulted in 3,765 incidents, 806 million records exposed, and $157 billion in data breach costs in only the past six years. This presentation will highlight recent and current developments in the evolution of both attacks and defenses.

Women's CONNECT Event

Hosted by SANS COINS program and ISSA WIS SIG

Joins SANS and the ISSA International Women in Security Special Interest Group (WIS SIG) as we partner with local association chapters and groups to foster an evening of connections, both by having their members attend and by having group representatives on hand to discuss their group, its activities and benefits of membership.

Continuous Ownage: Why You Need Continuous Monitoring

Bryan Simon

Repeat after me: I will be breached. Most organizations realize this fact too late, usually after a third party informs them months after the initial compromise. Treating security monitoring as a quarterly auditing process means most compromises will go undetected for weeks or months. The attacks are continuous, and the monitoring must match. This talk will help you face this problem and describe how to move your organization to a more defensible security architecture that enables continuous security monitoring. The talk will also give you a hint at the value you and your organization will gain from attending Seth Misenar and Eric Conrad's course: SANS SEC511: Continuous Monitoring and Security Operations.

Running Away from Security: Web App Vulnerabilities and OSINT Collide – *Micah Hoffman*

Lately it seems like more and more of our lives are being sucked into the computer world. There are wrist-sensors for tracking our steps, phone apps that plot our workouts on maps, and sites to share our healthy-eating and weight-loss progress. When people sign up for these sites, they usually use pseudonyms or the sites give them a unique numbered ID to keep their information "private." How hard would it be to connect a person's step-counting, diet history and other info on these health sites to their real lives? Are businesses using these sites for non-fitness purposes? This talk will show weaknesses in several web applications used for health and exercise tracking and reveal [spoiler alert] how trivial it is to find the real people behind the "private" accounts.

(Am)Cache Rules Everything Around Me – *Eric Zimmerman*

Amcache is a valuable artifact for forensic examiners because it contains a wealth of information related to evidence of execution of programs, including installed applications and other executables that have been run on a computer, the SHA-1 value of the program, and several time stamps of interest including last modified time as well as the first time a program was run. By understanding the data available in the Amcache hive, examiners will be able to build better timelines, create whitelists and blacklists of programs to exclude or look for on other systems, and quickly find outliers in the vast amount of data contained in Amcache hives. People attending this session will come away with an understanding of how data are structured and interrelated in the different parts of an Amcache hive. Attendees will receive free open-source tools that can process these hives quickly and efficiently.

DLP FAIL!!! Using Encoding, Steganography, and Covert Channels to Evade DLP and Other Critical Controls – *Kevin Fiscus*

It's all about the information! Two decades after the movie *Sneakers*, the quote remains as relevant, if not more so, than ever. The fact that someone hacks into an environment is interesting but not that relevant. What is important is what happens after the compromise. If the data are destroyed or modified, organizations are negatively impacted but the benefits to an attacker for destruction or alteration are somewhat limited. Stealing information, however, is highly profitable. Identity theft, espionage, and financial attacks involve the exfiltration of sensitive data. As a result, organizations deploy tools to detect and/or stop that data exfiltration. While these tools can be extremely valuable, many have serious weaknesses: attackers can encode, hide, or obfuscate the data, or can use secret communication channels. This session will talk about and demonstrate a range of these methods.

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FUTURE SANS TRAINING EVENTS

ICS Security Training – Houston 2016
Houston, TX | Jul 25-30

San Jose 2016
San Jose, CA | Jul 25-30

Boston 2016
Boston, MA | Aug 1-6

Security Awareness SUMMIT & TRAINING 2016
San Francisco, CA | Aug 1-10

Portland 2016
Portland, OR | Aug 8-13

Dallas 2016
Dallas, TX | Aug 8-13

Data Breach SUMMIT
Chicago, IL | Aug 18

Chicago 2016
Chicago, IL | Aug 22-27

Alaska 2016
Anchorage, AK | Aug 22-27

Virginia Beach 2016
Virginia Beach, VA | Aug 22 - Sep 2

NORTHERN VIRGINIA
Crystal City 2016
Crystal City, VA | Sep 6-11

Network Security 2016
Las Vegas, NV | Sep 10-19

Security Leadership SUMMIT & TRAINING 2016
Dallas, TX | Sep 27 - Oct 4

Seattle 2016
Seattle, WA | Oct 3-8

Information on all events can be found at
www.sans.org/security-training/by-location/all

SANS BALTIMORE 2016

Hotel Information

Training Campus
Sheraton Inner Harbor

300 South Charles Street
Baltimore, MD 21201 | 410-962-8300
www.sans.org/event/baltimore-2016/location

Sheraton Inner Harbor Hotel has everything you need for a comfortable and relaxing stay. Dine in one of our two Sheraton Baltimore Inner Harbor restaurants or unwind in our indoor heated pool and sauna. Spend a day at the National Aquarium with your family. Or if you're traveling for business, the Baltimore Convention Center is located right next door.

Special Hotel Rates Available

A special discounted rate of $205.00 S/D will be honored based on space availability. Government per diem rooms are available with proper ID; you will need to call reservations and ask for the SANS government rate. These rates include high-speed Internet in your room and are only available through 5:00pm local time September 9, 2016.

Top 5 reasons to stay at the Sheraton Inner Harbor

1. All SANS attendees receive complimentary high-speed Internet when booking in the SANS block.
2. No need to factor in daily cab fees and the time associated with travel to alternate hotels.
3. By staying at the Sheraton Inner Harbor you gain the opportunity to further network with your industry peers and remain in the center of the activity surrounding the training event.
4. SANS schedules morning and evening events at the Sheraton Inner Harbor that you won't want to miss!
5. Everything is in one convenient location!

SANS BALTIMORE 2016

Registration Information

We recommend you register early to ensure you get your first choice of courses.

Register online at www.sans.org/baltimore

Select your course or courses and indicate whether you plan to test for GIAC certification.

If the course is still open, the secure, online registration server will accept your registration. Sold-out courses will be removed from the online registration. Everyone with Internet access must complete the online registration form. We do not take registrations by phone.

Use code **EarlyBird16** when registering early

Pay Early and Save

	DATE	DISCOUNT	DATE	DISCOUNT
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Some restrictions apply.

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You may substitute another person in your place at any time, at no charge, by e-mail: registration@sans.org or fax: 301-951-0140. Cancellation requests without substitution must be submitted in writing, by mail, or fax, and postmarked by September 21, 2016 – processing fees may apply.

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Analyst Webcasts – A follow-on to the SANS Analyst Program, Analyst Webcasts provide key information from our whitepapers and surveys.

WhatWorks Webcasts – The SANS WhatWorks webcasts bring powerful customer experiences showing how end users resolved specific IT Security issues.

Tool Talks – Tool Talks are designed to give you a solid understanding of a problem, and to show how a vendor's commercial tool can be used to solve or mitigate that problem.

NEWSLETTERS

NewsBites – Twice-weekly high-level executive summary of the most important news relevant to cybersecurity professionals

OUCH! – The world's leading monthly free security-awareness newsletter designed for the common computer user

@RISK: The Consensus Security Alert – A reliable weekly summary of (1) newly discovered attack vectors, (2) vulnerabilities with active new exploits, (3) how recent attacks worked, and (4) other valuable data

OTHER FREE RESOURCES

- InfoSec Reading Room
- Top 25 Software Errors
- 20 Critical Controls
- Security Policies
- Intrusion Detection FAQs
- Tip of the Day
- Security Posters
- Thought Leaders
- 20 Coolest Careers
- Security Glossary
- SCORE (Security Consensus Operational Readiness Evaluation)

www.sans.org/security-resources