

Advanced Systems Security: Attacks and Defenses

Overview

It is hard to open a paper today without yet another story about a system that was hacked or sensitive information that was stolen by cybercrooks. Even with the most advanced defenses in place, attackers still manage to exploit our computer systems and gain full control over the software. How do they do this? A cybersecurity expert needs answers for (1) what are the current trends in attacks and (2) what are the most promising directions for our defenses?

In this course, we will look at system security—human vulnerabilities as well as state-of-the-art research in attacks and defenses. The course will address issues related to system security in depth and discuss how attackers exploit our systems, evade our defenses and build malicious infrastructures that are hard to take down. We shall explicitly focus on systems security rather than (say) cryptography, as we want to show participants how attackers penetrate systems today.

Specifically, the course focuses on (1) network security (sniffing, spoofing, hijacking, exploiting network protocols, DDoS, DNS attacks, etc.), (2) memory corruption and application security (buffer overflows, format string bugs, dangling pointers, shellcode, return oriented programming, sigreturn-oriented programming, counterfeit object-oriented programming, ASLR/DEP/canaries, control flow integrity and the state-of-the-art in exploitation), (3) botnets (centralised, peer-to-peer, fast flux, double flux).

Course participants will learn these topics through lectures and assignments. Details are available at MNIT website (<http://mnit.ac.in>)

Dates	Course Duration : July 4 – 10, 2016
	Last date of Registration : June 30, 2016
Modules	A: Botnets and financial malware : July 4, 2016
	B: Application security : July 5, 2016
	C: Advanced exploitation : July 6-7, 2016
	D: Network Security : July 8, 2016
	E: Information Security : July 9-10, 2016 (National experts)
Number of participants for the course will be limited to fifty. Selection of participants shall be on “First Come First Served” basis only.	
You Should Attend If you are ...	<ul style="list-style-type: none"> ▪ a computer scientist with an interest in security and hard system-level problems, and you have knowledge of C or C++ (and ideally a bit of assembly) ▪ Security Engineers/researchers from Govt. organizations including R&D laboratories ▪ Faculty from reputed academic institutions and technical institutions. ▪ Students at all levels (BTech/MSc/MTech/PhD)
Fees	GIAN Portal registration fee : Rs 500 (mandatory for all participants).
	<ol style="list-style-type: none"> 1. Create login and password at http://www.gian.iitkgp.ac.in/GREGN/index 2. Login and complete the Registration Form and select Course(s) 3. Confirm application and pay Rs. 500/- (non-refundable) through online payment gateway. 4. Download “pdf file” of the application form and email it to the Course Coordinator.
Registration Fee (exclusive of GIAN Portal Registration Fee)	
Participants from abroad : US \$100	
Industry/ Research Organizations : Rs 5000	
Faculty from other Academic Institutions : Rs 3500	
Students from other Academic Institutions : Rs 1000	
Faculty /Students from MNIT and IIIT Kota : Rs 1000	

Registration

1. Fees may be paid via Demand Draft in favour of "REGISTRAR (SPONSORED RESEARCH) MNIT Jaipur" payable at Jaipur.
2. Or fees can be paid through National Electronic Funds Transfer (NEFT)
Account No. : 676801700388
In name of "REGISTRAR (SPONSORED RESEARCH) MNIT Jaipur"
Bank : ICICI Bank, Branch MNIT Jaipur
IFSC Code: ICIC0006768.
3. Email filled in "Registration Form", scan copy of "Demand Draft/ NEFT Transaction Receipt" and pdf file (downloaded from GIAN Portal Registration) to vlaxmi@mnit.ac.in. Please mention "GIAN (Advanced System Security) in Subject of the email on or before June 20, 2016.

The Faculty



Prof. Herbert Bos is full professor of Systems and Network Security at Vrije Universiteit Amsterdam. His research interests include systems security and operating systems. **Prof. dr. Herbert Bos** obtained his Ph.D. from the computer laboratory at Cambridge University. He has published in all the top conferences in computer systems security (such as Security & Privacy, CCS, USENIX Security and NDSS), as well as operating systems (OSDI, Eurosys, USENIX, etc.). He is the first computer scientist in the Netherlands to win the prestigious ERC and the equally prestigious VIC grant. Three of his ex-students and one of his postdocs have won the ACM SIGOPS EuroSys Roger Needham Ph.D. Award, for best Ph.D. in computer systems in Europe. In 2015, he won the Dutch Cyber Security Research Award for best paper from the Netherlands in the area of cyber security (across all disciplines). In that year, he also won the university's award for best senior lecturer in the Sciences. Outside academia, his research group is well-known for finding security vulnerabilities in popular systems (Android, Linux, Mac OS X, etc.), as well as for the takedown of the infamous GameOver Zeus botnet (with the FBI, EuroPol and others). With Andy Tanenbaum he co-authors the book Modern Operating Systems, one of the most popular computer science text books in the world.



Dr. Vijay Laxmi is an associate professor at Computer Science and Engineering Department of Malaviya National Institute of Technology Jaipur. She has been teaching in MNIT since 1995. Her research interests include information security. She obtained PhD from University of Southampton, UK under Commonwealth Scholarship and Fellowship Plan. She has guided 12 PhDs and has 125 publications in Journals and Conferences. She has been involved in 12 R&D projects, seven of which are International Collaboration.



Mr. Ramesh Babu Battula is currently an assistant professor at Computer Science and Engineering Department, Malaviya National Institute of Technology Jaipur, India. His research interests are in the areas of information security, cryptography, next generation wireless networks, and ad-hoc networks with emphasis on mathematical modeling and performance analysis. He received projects from DST, India and published several research articles in various conferences and journals. He has served as TPC member in multiple International conferences and reviewer of top journals like IEEE Transactions on Communication, Wireless Communications, IEEE Journal of Systems, etc. He is a member of IEEE Communications and ACM communications.

Course Coordinators

Dr. Vijay Laxmi
Associate Professor,
Computer Science and Engineering,
Malaviya National Institute of
Technology Jaipur
Tel: +91-141-2713333 (O),
+91 9549659444 (M)
Email: vlaxmi@mnit.ac.in

Mr. Ramesh B. Battula
Assistant Professor,
Computer Science and Engineering,
Malaviya National Institute of
Technology Jaipur
Tel: +91-141-2713497 (O)
Email: rbbattula.cse@mnit.ac.in