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Ethical Hacking

By Prof. Indranil Sen Gupta | IIT Kharagpur

Learners enrolled: 45934

Ethical hacking is a subject that has become very important in present-day context, and can help individuals and organizations to adopt safe practices and usage of their IT infrastructure. Starting from the basic topics like networking, network security and cryptography, the course will cover various attacks and vulnerabilities and ways to secure them. There will be hands-on demonstrations that will be helpful to the participants. The participants are encouraged to try and replicate the demonstration experiments that will be discussed as part of the course.

INTENDED AUDIENCE: Computer Science and Engineering / Information Technology / Electronics and Communication / Electrical Engineering

PRE-REQUISITE

INDUSTRY SUP



epts in programming and networking

(https://swayam.gov.in/)



(https://swayam.gov.in/nc_details/NPTEL)

Summary

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Course Status :	Completed
Course Type :	Elective
Duration :	12 weeks
Category :	<ul style="list-style-type: none"> Computer Science and Engineering
Credit Points :	3
Level :	Undergraduate/Postgraduate
Start Date :	24 Jan 2022
End Date :	15 Apr 2022
Enrollment Ends :	07 Feb 2022
Exam Date :	23 Apr 2022 IST

Note: This exam date is subjected to change based on seat availability. You can check final exam date on your hall ticket.

This is an AICTE approved FDP course

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(https://www.addtoany.com/share?url=https%3A%2F%2Fonlinecourses.nptel.ac.in%2Fnoc22_cs13%2Fpreview&title=Ethical%20Hacking%20-%20Course)

Course layout

Week 1: Introduction to ethical hacking. Fundamentals of computer networking. TCP/IP protocol stack.

Week 2: IP addressing and routing. TCP and UDP. IP subnets.

Week 3: Routing protocols. IP version 6.

Week-4: Installation of attacker and victim system. Information gathering using advanced google search, archive.org, netcraft, whois, host, dig, dnsenum and NMAP tool.

Week-5: Vulnerability scanning using NMAP and Nessus. Creating a secure hacking environment.

System Hacking: password cracking, privilege escalation, application execution. Malware and

Virus. ARP spoofing.

Week 6: Introduction to cryptography: symmetric key encryption, asymmetric key encryption, public key cryptography. (https://swayam.gov.in/) (https://swayam.gov.in/nc_details/NPTEL)

Week 7: Cryptographic hash functions, digital signature and certificate, applications.

Week 8: Steganography, biometric authentication, network-based attacks, DNS and Email security. (https://swayam.gov.in/about) | All Courses |

Week-9: Packet sniffing using Wireshark and Burp Suite, password attack using Burp Suite.

Social engineering attacks and Denial of Service attacks.

Week 10: Elements of hardware security: side-channel attacks, physical inoperable functions, hardware trojans.

Week-11: Different types of attacks using Metasploit framework: password cracking, privilege escalation, remote code execution, etc. Attack on web servers: password attack, SQL injection, cross-site scripting.

Week 12: Case studies: various attack scenarios and their remedies.

Books and references

1. Data and Computer Communications -- W. Stallings.
2. Data Communication and Networking -- B. A. Forouzan
3. TCP/IP Protocol Suite -- B. A. Forouzan
4. UNIX Network Programming -- W. R. Stallings
5. Introduction to Computer Networks and Cybersecurity -- C-H. Wu and J. D. Irwin
6. Cryptography and Network Security: Principles and Practice -- W. Stallings
7. ** Various web resources **

Instructor bio



Prof. Indranil Sengupta has obtained his B.Tech., M.Tech. and Ph.D. degrees in Computer Science from the University of Calcutta. He joined the Indian Institute of Technology, Kharagpur, as a faculty member in 1988, in the Department of CSE, where he is presently a full Professor. He had been the former Heads of the Department of Computer Science and Engineering and also the School of Information Technology of the Institute. He was also the Managing Director of Science and Technology Entrepreneurship Park (STEP), and the Professor-in-Charge of a Centre of Excellence in Information Assurance funded by the Ministry of Defense. He has over 30 years of teaching and research experience. He has guided 22 PhD students, and has more than 200 publications to his credit in international journals and conferences. His research interests include reversible and quantum computing, VLSI design and testing, and information security. He is a Senior Member of IEEE.

He had been the General Chairs of Asian Test Symposium (ATS-2005), International Conference on Cryptology in India (INDOCRYPT-2008), International Symposium on VLSI Design and Test (VDAT-2012), International Symposium on Electronic System Design (ISED-2012), and the International Conference on Reversible Computation (RC-2017).

Course certificate

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The course is free to enroll and learn from. But if you want a certificate, you have to register and write the proctored exam conducted by us in person at any of the designated exam centres.

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The exam is optional for a fee of Rs 1000/- (Rupees one thousand only).

Date and Time of Exams: **23 April 2022** Morning session 9am to 12 noon; Afternoon Session 2pm to 5pm.

Registration url: Announcements will be made when the registration form is open for registrations.

The online registration form has to be filled and the certification exam fee needs to be paid. More details will be made available when the exam registration form is published. If there are any changes, it will be mentioned then.

Please check the form for more details on the cities where the exams will be held, the conditions you agree to when you fill the form etc.

CRITERIA TO GET A CERTIFICATE

Average assignment score = 25% of average of best 8 assignments out of the total 12 assignments given in the course.

Exam score = 75% of the proctored certification exam score out of 100

Final score = Average assignment score + Exam score

YOU WILL BE ELIGIBLE FOR A CERTIFICATE ONLY IF AVERAGE ASSIGNMENT SCORE $\geq 10/25$ AND EXAM SCORE $\geq 30/75$. If one of the 2 criteria is not met, you will not get the certificate even if the Final score $\geq 40/100$.

Certificate will have your name, photograph and the score in the final exam with the breakup. It will have the logos of NPTEL and IIT Kharagpur. It will be e-verifiable at nptel.ac.in/noc (<http://nptel.ac.in/noc>).

Only the e-certificate will be made available. Hard copies will not be dispatched.

Once again, thanks for your interest in our online courses and certification. Happy learning.

- NPTEL team



(<https://swayam.gov.in/>)
Ministry of Education
Government of India



(https://swayam.gov.in/nc_details/NPTEL)

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Initiative by : Ministry of Education (Govt of India)



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This certificate is awarded to
AKSHARA A
for successfully completing the course

Ethical Hacking

with a consolidated score of **66** %

Online Assignments	22.69/25	Proctored Exam	42.97/75
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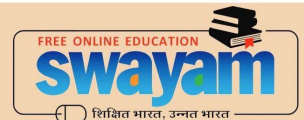
Total number of candidates certified in this course: **2228**

Jan-Apr 2023
(12 week course)

Prof. Debjani Chakraborty
Coordinator, NPTEL
IIT Kharagpur



Indian Institute of Technology Kharagpur



Roll No: NPTEL23CS44S64260179

To validate the certificate



No. of credits recommended: 3 or 4



Elite

NPTEL Online Certification

(Funded by the MoE, Govt. of India)



This certificate is awarded to
AYYANAR S
for successfully completing the course

Ethical Hacking

with a consolidated score of **68** %

Online Assignments	21.38/25	Proctored Exam	46.25/75
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Total number of candidates certified in this course: **2228**

Jan-Apr 2023
(12 week course)

Prof. Debjani Chakraborty
Coordinator, NPTEL
IIT Kharagpur



Indian Institute of Technology Kharagpur



Roll No: NPTEL23CS44S24110541

To validate the certificate



No. of credits recommended: 3 or 4



Elite

NPTEL Online Certification

(Funded by the MoE, Govt. of India)



This certificate is awarded to
RAJ KUMAR C
for successfully completing the course

Ethical Hacking

with a consolidated score of **64** %

Online Assignments	22.66/25	Proctored Exam	41.5/75
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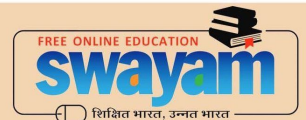
Total number of candidates certified in this course: **2228**

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(12 week course)

Prof. Debjani Chakraborty
Coordinator, NPTEL
IIT Kharagpur



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Roll No: NPTEL23CS44S24110577

To validate the certificate



No. of credits recommended: 3 or 4



NPTEL Online Certification

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This certificate is awarded to
HEMALATHA G
for successfully completing the course

Ethical Hacking

with a consolidated score of **55** %

Online Assignments	22.06/25	Proctored Exam	32.75/75
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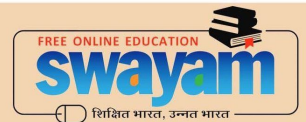
Total number of candidates certified in this course: **2228**

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(12 week course)

Prof. Debjani Chakraborty
Coordinator, NPTEL
IIT Kharagpur



Indian Institute of Technology Kharagpur



Roll No: NPTEL23CS44S24110832

To validate the certificate



No. of credits recommended: 3 or 4



NPTEL Online Certification

(Funded by the MoE, Govt. of India)



This certificate is awarded to
JAYASURUTHY I
for successfully completing the course

Ethical Hacking

with a consolidated score of **56** %

Online Assignments	22.56/25	Proctored Exam	33/75
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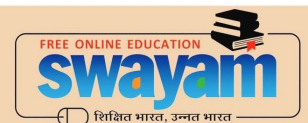
Total number of candidates certified in this course: **2228**

Jan-Apr 2023
(12 week course)

Prof. Debjani Chakraborty
Coordinator, NPTEL
IIT Kharagpur



Indian Institute of Technology Kharagpur



Roll No: NPTEL23CS44S24110847

To validate the certificate



No. of credits recommended: 3 or 4



NPTEL Online Certification

(Funded by the MoE, Govt. of India)



This certificate is awarded to
JEYARUBY J
for successfully completing the course

Ethical Hacking

with a consolidated score of **53** %

Online Assignments	22.56/25	Proctored Exam	30/75
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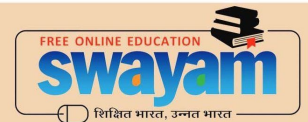
Total number of candidates certified in this course: **2228**

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Prof. Debjani Chakraborty
Coordinator, NPTEL
IIT Kharagpur



Indian Institute of Technology Kharagpur



Roll No: NPTEL23CS44S14111569

To validate the certificate



No. of credits recommended: 3 or 4



Elite

NPTEL Online Certification

(Funded by the MoE, Govt. of India)



This certificate is awarded to
KARUPPASAMY S
for successfully completing the course

Ethical Hacking

with a consolidated score of **62** %

Online Assignments	22.66/25	Proctored Exam	39/75
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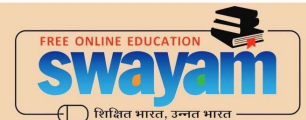
Total number of candidates certified in this course: **2228**

Jan-Apr 2023
(12 week course)

Prof. Debjani Chakraborty
Coordinator, NPTEL
IIT Kharagpur



Indian Institute of Technology Kharagpur



Roll No: NPTEL23CS44S24110899

To validate the certificate



No. of credits recommended: 3 or 4



NPTEL Online Certification

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This certificate is awarded to
AARTHIKA M
for successfully completing the course

Ethical Hacking

with a consolidated score of **53** %

Online Assignments	22.5/25	Proctored Exam	30/75
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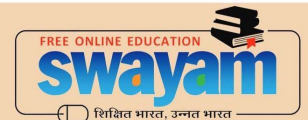
Total number of candidates certified in this course: **2228**

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(12 week course)

Prof. Debjani Chakraborty
Coordinator, NPTEL
IIT Kharagpur



Indian Institute of Technology Kharagpur



Roll No: NPTEL23CS44S14110950

To validate the certificate



No. of credits recommended: 3 or 4



Elite

NPTEL Online Certification

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This certificate is awarded to
N SAIARUNAAVARSHINI
for successfully completing the course

Ethical Hacking

with a consolidated score of **60** %

Online Assignments	22.66/25	Proctored Exam	36.98/75
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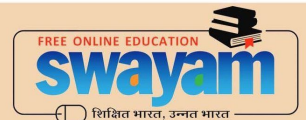
Total number of candidates certified in this course: **2228**

Jan-Apr 2023
(12 week course)

Prof. Debjani Chakraborty
Coordinator, NPTEL
IIT Kharagpur



Indian Institute of Technology Kharagpur



Roll No: NPTEL23CS44S14110968

To validate the certificate



No. of credits recommended: 3 or 4



NPTEL Online Certification

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This certificate is awarded to
JAYANAGARAJ R
for successfully completing the course

Ethical Hacking

with a consolidated score of **52** %

Online Assignments	22.13/25	Proctored Exam	30.1/75
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Total number of candidates certified in this course: **2228**

Jan-Apr 2023
(12 week course)

Prof. Debjani Chakraborty
Coordinator, NPTEL
IIT Kharagpur



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Roll No: NPTEL23CS44S14111640

To validate the certificate



No. of credits recommended: 3 or 4



NPTEL Online Certification

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This certificate is awarded to
ANUB PRASAD A B
for successfully completing the course

Ethical Hacking

with a consolidated score of **53** %

Online Assignments	22.66/25	Proctored Exam	30/75
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Total number of candidates certified in this course: **2228**

Jan-Apr 2023
(12 week course)

Prof. Debjani Chakraborty
Coordinator, NPTEL
IIT Kharagpur



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Roll No: NPTEL23CS44S14110999

To validate the certificate



No. of credits recommended: 3 or 4



NPTEL Online Certification

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This certificate is awarded to
RACHEL E
for successfully completing the course

Ethical Hacking

with a consolidated score of **57** %

Online Assignments	22.06/25	Proctored Exam	34.7/75
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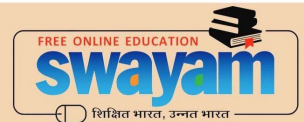
Total number of candidates certified in this course: **2228**

Jan-Apr 2023
(12 week course)

Prof. Debjani Chakraborty
Coordinator, NPTEL
IIT Kharagpur



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Roll No: NPTEL23CS44S14110318

To validate the certificate



No. of credits recommended: 3 or 4



NPTEL Online Certification

(Funded by the MoE, Govt. of India)



This certificate is awarded to
SENTHIL KUMARI MATHANA K
for successfully completing the course

Ethical Hacking

with a consolidated score of **56** %

Online Assignments	22.66/25	Proctored Exam	33.68/75
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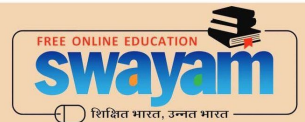
Total number of candidates certified in this course: **2228**

Jan-Apr 2023
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Prof. Debjani Chakraborty
Coordinator, NPTEL
IIT Kharagpur



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Roll No: NPTEL23CS44S14111071

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No. of credits recommended: 3 or 4



NPTEL Online Certification

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This certificate is awarded to
ROYSTON D
for successfully completing the course

Ethical Hacking

with a consolidated score of **53** %

Online Assignments	22.63/25	Proctored Exam	30/75
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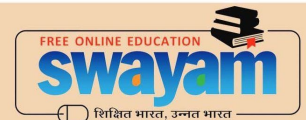
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Jan-Apr 2023
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Prof. Debjani Chakraborty
Coordinator, NPTEL
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Roll No: NPTEL23CS44S14111100

To validate the certificate



No. of credits recommended: 3 or 4



NPTEL Online Certification

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This certificate is awarded to
SAKTHI K S
for successfully completing the course

Ethical Hacking

with a consolidated score of **54** %

Online Assignments	22.66/25	Proctored Exam	31.63/75
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Total number of candidates certified in this course: **2228**

Jan-Apr 2023
(12 week course)


Prof. Debjani Chakraborty
Coordinator, NPTEL
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Roll No: NPTEL23CS44S14111125

To validate the certificate



No. of credits recommended: 3 or 4



Elite

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This certificate is awarded to
SAMUEL MAMERU CARR
for successfully completing the course



Ethical Hacking

with a consolidated score of **80** %

Online Assignments	21.25/25	Proctored Exam	59.18/75
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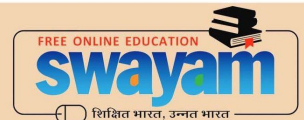
Total number of candidates certified in this course: **2228**

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Prof. Debjani Chakraborty
Coordinator, NPTEL
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Indian Institute of Technology Kharagpur



Roll No: NPTEL23CS44S14111136

To validate the certificate



No. of credits recommended: 3 or 4



Elite

NPTEL Online Certification

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This certificate is awarded to

S SAHANA

for successfully completing the course

Ethical Hacking

with a consolidated score of **65** %

Online Assignments	22.66/25	Proctored Exam	42.61/75
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Total number of candidates certified in this course: **2228**

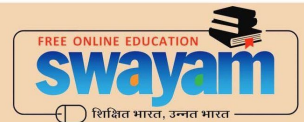
Jan-Apr 2023

(12 week course)

Prof. Debjani Chakraborty
Coordinator, NPTEL
IIT Kharagpur



Indian Institute of Technology Kharagpur



Roll No: NPTEL23CS44S14111262

To validate the certificate



No. of credits recommended: 3 or 4



Elite

NPTEL Online Certification

(Funded by the MoE, Govt. of India)



This certificate is awarded to
SUNDARRAJAN J
for successfully completing the course

Ethical Hacking

with a consolidated score of **60** %

Online Assignments	22.66/25	Proctored Exam	37.22/75
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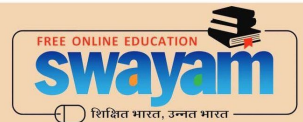
Total number of candidates certified in this course: **2228**

Jan-Apr 2023
(12 week course)

Prof. Debjani Chakraborty
Coordinator, NPTEL
IIT Kharagpur



Indian Institute of Technology Kharagpur



Roll No: NPTEL23CS44S14110416

To validate the certificate



No. of credits recommended: 3 or 4



NPTEL Online Certification

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This certificate is awarded to
ANANTHA SHREE V
for successfully completing the course

Ethical Hacking

with a consolidated score of **56** %

Online Assignments	22.1/25	Proctored Exam	33.59/75
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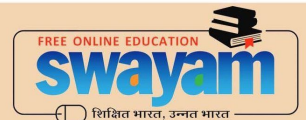
Total number of candidates certified in this course: **2228**

Jan-Apr 2023
(12 week course)

Prof. Debjani Chakraborty
Coordinator, NPTEL
IIT Kharagpur



Indian Institute of Technology Kharagpur



Roll No: NPTEL23CS44S64790292

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No. of credits recommended: 3 or 4



NPTEL Online Certification

(Funded by the MoE, Govt. of India)



This certificate is awarded to
G SRI VARSHA
for successfully completing the course

Ethical Hacking

with a consolidated score of **52** %

Online Assignments	22.1/25	Proctored Exam	30.1/75
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Total number of candidates certified in this course: **2228**

Jan-Apr 2023
(12 week course)

Prof. Debjani Chakraborty
Coordinator, NPTEL
IIT Kharagpur



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Roll No: NPTEL23CS44S14111335

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No. of credits recommended: 3 or 4