



# The Art of Secrecy

Cryptography and Secure Communication

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# The Art of Secrecy: Cryptography and Secure Communication

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**DeepScience**

*Published, marketed, and distributed by:*

Deep Science Publishing, 2025  
USA | UK | India | Turkey  
Reg. No. MH-33-0523625  
[www.deepscienceresearch.com](http://www.deepscienceresearch.com)  
[editor@deepscienceresearch.com](mailto:editor@deepscienceresearch.com)  
WhatsApp: +91 7977171947

ISBN: 978-93-7185-663-8

E-ISBN: 978-93-7185-174-9

<https://doi.org/10.70593/978-93-7185-174-9>

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**Citation:** Dastagiraiah, C., Kovoov, M., Veeranna, T., & Balakrishna, C. (2025). *The Art of Secrecy: Cryptography and Secure Communication*. Deep Science Publishing. <https://doi.org/10.70593/978-93-7185-174-9>

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## Preface

*The Art of Secrecy: Cryptography and Secure Communication* is a comprehensive guide that explores the essential principles and techniques underlying modern cryptography and secure communication systems. This book outlines a systematic method of solving how information security is accomplished, starting with fundamental Security Concepts that describe the domain of threats, vulnerabilities, and countermeasures.

Next, it gets into Cryptography Concepts and Techniques, describing the algorithms and mathematical structures used to preserve confidentiality and integrity. The exploration of Symmetric Key Ciphers offers insight into key encryption methods vital to protecting sensitive information.

Subsequent chapters highlight Message Authentication Algorithms and Hash Functions which are essential for the assurance of data correctness and overhauling. Focusing on practical security in particular, the book includes hands-on materials for E-Mail Security and Web Security, exploring current problems and solutions related to these modern means of communication.

The last part of the book includes endeavored real-life examples in respect of the hypothetical suggestions regarding cryptography and network security, characterizing the characterization of theory and that on selection and lessons learned from security execution. It will appeal to those wishing to understand the art and science of secrecy in the digital age, providing a resource for students, researchers and professionals.

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## References:

1. Kessler, G. C. (2003). An overview of cryptography.
2. J. Callas, "The Future of Cryptography," *Information Systems Security*, vol. 16, no. 1, pp. 15-22, 2007.
3. B. Preneel, *Understanding Cryptography: A Textbook for Students and Practitioners*, London: Springer, 2010.
4. Shashi Mehrotra Seth, Rajan Mishra," Comparative Analysis Of Encryption Algorithms For Data Communication", *IJCST Vol. 2, Issue 2*, pp.192-192 , June 2011.
5. Gupta, A., & Walia, N. K. (2014). Cryptography algorithms: a review. *International Journal of Engineering Development and Research*, 2(2), 1667-1672.
6. Kumar, S. N. (2015). Review on network security and cryptography. *International Transaction of Electrical and Computer Engineers System*, 3(1), 1-11.
7. N. Sharma, Prabhjot and H. Kaur, "A Review of Information Security using Cryptography Technique," *International Journal of Advanced Research in Computer Science*, vol. 8, no. Special Issue, pp. 323-326, 2017.
8. S. Tayal, N. Gupta, P. Gupta, D. Goyal and M. Goyal, "A Review paper on Network Security and Cryptography," *Advances in Computational Sciences and Technology* , vol. 10, no. 5, pp. 763- 770, 2017.
9. <http://en.wikipedia.org/>, Cryptography