



**Sub Committee for Curriculum Development**

**Data Science Specialization**

**Post Graduate**

**Course Title:** Cyber Security Analytics

**Course Code:**

**Number of Credits:** 3

**Level:** 4

**Course Code:** T3462

**Learning Objective/Outcome (s):**

1. To interpret the understanding of Cyber security, implications and the Cyber warfare through cases.
2. To analyze the focus on International cyber security needs.

**Pre-learning** Students should have studied the following courses in the previous semesters

Maths and stats for DS, Predictive analytics, Operation Research, Statistics II, Data Protection and Privacy and Networking Fundamentals

| <b>Sr.No.</b> | <b>Topics</b>  | <b>Hours</b> |
|---------------|--|--------------|
| <b>1.</b>     | <b>Introduction to Information security concepts</b> <ul style="list-style-type: none"> <li>• Types of Attacks- Physical Attacks and Modular Exponentiation</li> <li>• Side Channel Attacks and Countermeasures</li> <li>• Introduction to Cryptography</li> <li>• Access Control and Authentication mechanisms</li> <li>• Telecommunications and Network Security</li> <li>• Operations Security</li> <li>• Physical and Environmental Security</li> <li>• Business Continuity and Disaster Recovery Planning</li> <li>• Security Architecture and Design</li> <li>• Software Development Security</li> <li>• Static Program Analysis</li> <li>• Information Security Governance and Risk Management</li> <li>• Legal, Regulations, Investigations, and Compliance</li> </ul> | <b>8</b>     |
| <b>2.</b>     | <b>Introduction to Cyber Security</b> <ul style="list-style-type: none"> <li>• Web security: Attacks and defenses</li> <li>• Penetration and Fuzz Testing</li> </ul>   | <b>4</b>     |

|          |   |          |
|----------|---|----------|
|          | <ul style="list-style-type: none"> <li>• Role of Cyber Security</li> </ul>  |          |
| <b>3</b> | <b>Introduction to Security Intelligence and Analytics</b> <ul style="list-style-type: none"> <li>• Evolution of Cyber Threat</li> <li>• Understanding the Data</li> <li>• Drawing Conclusions</li> <li>• Perspective-Same Attack, Different Lens</li> <li>• Challenges with Traditional Security Controls</li> <li>• Security Analytics and Intelligence (SAI) Framework</li> <li>• Critical Success Factors for Developing the SAI Framework</li> <li>• Approach for Building the SAI Framework</li> <li>• Security information and event management (SIEM) platform</li> </ul> | <b>7</b> |
| <b>4</b> | <b>Big Data Analytics for Security</b> <ul style="list-style-type: none"> <li>• Enterprise Events Analytics</li> <li>• Netflow Monitoring to Identify Botnets</li> <li>• Advanced Persistent Threats Detection</li> <li>• --Beehive: Behavior Profiling for APT Detection</li> <li>• --Using Large-Scale Distributed Computing to Unveil APTs</li> <li>• The WINE Platform for Experimenting with Big Data Analytics in Security</li> <li>• Data Sharing and Provenance</li> </ul>  | <b>8</b> |
| <b>5</b> | <b>Risk Analytics</b> <ul style="list-style-type: none"> <li>• Current State of Risk 'Intelligence'</li> <li>• Info Security HAS a Risk Analytics Problem</li> <li>• Current State Of Technology Risk</li> <li>• Security Operations</li> <li>• Risk and Compliance</li> <li>• Ultimate Risk Analytics End Goal</li> </ul>  | <b>6</b> |
| <b>6</b> |   | <b>6</b> |
|          |   | 3        |

## Pedagogy

### Books Recommended

- Susan Hansche, C. I. S. S. P., John Berti, C. I. S. S. P., & Hare, C. (2003). *Official (ISC) 2 guide to the CISSP exam*. CRC Press.
- Kahate, A. (2013). *Cryptography and network security*. Tata McGraw-Hill Education.
- Forouzan, A. B. (2006). *Data communications & networking (sie)*. Tata McGraw-Hill Education.
- Gordon, L. A., & Loeb, M. P. (2006). *Managing cybersecurity resources: a cost-benefit analysis* (Vol. 1). New York: McGraw-Hill.

Additional reading will be required

### Assessment/ Evaluation Methods

**Internal Evaluation: 60 Marks**

**External Evaluation: 40 Marks**

**Benchmarked against similar courses in other national/ international universities /organizations**

| <b>S. No.</b> | <b>Name of the Course</b> | <b>Name of University where it is offered</b> |
|---------------|---------------------------|---|
|               |                           |   |
|               |                           |   |
|               |                           |   |
|               |                           |   |
|               |                           |   |
|               |                           |   |
|               |                           |   |

|                        |                  |  |  |  |  |
|------------------------|------------------|--|--|--|--|
| <b>Name of Members</b> | Angelina Gokhale |  |  |  |  |
| <b>Designation</b>     |                  |  |  |  |  |
| <b>Org. / Inst.</b>    |                  |  |  |  |  |
| <b>Signature</b>       |                  |  |  |  |  |

|                        |  |  |  |  |  |
|------------------------|--|--|--|--|--|
| <b>Name of Experts</b> |  |  |  |  |  |
| <b>Designation</b>     |  |  |  |  |  |
| <b>Org. / Inst.</b>    |  |  |  |  |  |
| <b>Signature</b>       |  |  |  |  |  |

**Signature of Dean:**

**Date:**