

REFERENCES:

1. David Kim and Michael G. Solomon, Fundamentals of Information Systems Security, Third Edition Transition Guide, Jones & Bartlett Learning, 2018.
2. Peter Trim and Yang – Im Lee, —Cyber Security Management- A Governance, Risk and Compliance Framework, Gower Publishing, England 2014.
3. Institute for Defence Studies and Analysis Report, India's Cyber Security Challenge, 2012 https://idsa.in/system/files/book/book_indiacybersecurity.pdf
4. John G. Voeller, Cyber Security, John Wiley & Sons, England, 2014.
5. Carol C. Woody, Nancy R. Mead, Cyber Security Engineering: A Practical Approach for Systems and Software Assurance, Addison-Wesley, 2016.
6. Edward Griffor, Handbook of System Safety and Security, Syngress and Elsevier Publications, 1st edition, 2017.
7. Thomas A. Johnson Cyber Security- Protecting Critical Infrastructures from Cyber Attack and Cyber Warfare, CRC Press, 2015.
8. NIST Cyber security Framework, Version 1.0, 2014.
9. CGI, —Cyber security in Modern Critical Infrastructure Environments, 2014.
10. Stuart Broderick J, Cyber Security Program, Cisco Security Solutions, June 2016.

CO	PO						PSO		
	1	2	3	4	5	6	1	2	3
1.	√		√					√	
2.	√		√				√	√	
3.	√		√	√		√	√	√	√
4.	√		√	√	√			√	√
5.	√		√	√	√			√	√

CP5087**SOFT COMPUTING****LT P C
3 0 0 3****OBJECTIVES:**

- To learn the key aspects of Soft computing and Neural networks.
- To study the fuzzy logic components.
- To gain insight onto neuro fuzzy modeling and control.
- To know about the components and building block hypothesis of genetic algorithm.
- To gain knowledge in machine learning through neural networks.

UNIT I INTRODUCTION TO SOFT COMPUTING**9**

Evolution of Computing – Soft Computing Constituents – From Conventional AI to Computational Intelligence – Machine Learning Basics

UNIT II GENETIC ALGORITHMS**9**

Introduction to Genetic Algorithms (GA) – Applications of GA – Building Block Hypothesis- Representation– Fitness Measures – Genetic Operators-. GA based Machine Learning.

UNIT III NEURAL NETWORKS**9**

Machine Learning using Neural Network, Adaptive Networks – Feed Forward Networks – Supervised Learning Neural Networks – Radial Basis Function Networks – Reinforcement Learning – Unsupervised Learning Neural Networks – Adaptive Resonance Architectures – Advances in Neural Networks.

UNIT IV FUZZY LOGIC**9**

Fuzzy Sets – Operations on Fuzzy Sets – Fuzzy Relations – Membership Functions-Fuzzy Rules and Fuzzy Reasoning – Fuzzy Inference Systems – Fuzzy Expert Systems – Fuzzy Decision Making.

UNIT V NEURO-FUZZY MODELING**9**

Adaptive Neuro-Fuzzy Inference Systems – Coactive Neuro-Fuzzy Modeling – Classification and Regression Trees – Data Clustering Algorithms – Rule based Structure Identification – Neuro-Fuzzy Control – Case Studies.

TOTAL : 45 PERIODS**OUTCOMES:**

Upon completion of the course, the student will be able to

- Differentiate Conventional AI and Computational Intelligence.
- Discuss on machine learning through neural networks.
- Apply knowledge in developing a Fuzzy expert system.
- Model Neuro Fuzzy system for clustering and classification.
- Discover knowledge to develop Genetic Algorithm and Support vector machine based machine learning system.

REFERENCES:

1. Jyh-Shing Roger Jang, Chuen-Tsai Sun, Eiji Mizutani, "Neuro-Fuzzy and Soft Computing", Prentice-Hall of India, 2002.
2. KwangH.Lee, "First course on Fuzzy Theory and Applications", Springer, 2005.
3. George J. Klir and Bo Yuan, "Fuzzy Sets and Fuzzy Logic-Theory and Applications", Prentice Hall, 1996.
4. James A. Freeman and David M. Skapura, "Neural Networks Algorithms, Applications, and Programming Techniques", Addison Wesley, 2003.
5. David E.Goldberg, "Genetic Algorithms in Search, Optimization and Machine Learning", Addison Wesley, 1989.
6. Mitchell Melanie, "An Introduction to Genetic Algorithm", MIT Press, 1996.
7. S.N.Sivanandam, S.N.Deepa, "Introduction to Genetic Algorithms", Springer, 2008 edition.

CO	PO						PSO		
	1	2	3	4	5	6	1	2	3
1.	√		√				√	√	
2.	√		√	√			√	√	√
3.	√		√	√	√	√	√	√	√
4.	√		√	√		√	√	√	√
5.	√		√	√		√	√	√	√