



Proposing Course for NSF EDU Proposal – Course Modules and Topics

Course Module 1: Introduction

1. Introduction to Medical Systems and their Evolution
2. Healthcare Information: Ethics, Rules, Regulations, Standards, and Practices
3. Introduction of Artificial Intelligence and Cyber security to Medical Science
4. Overview of Security and Intelligent Infrastructure in Medical Domain
5. Mathematics of AI and Cybersecurity in Medical Science
6. Engineering and Technical Skills from AI and Cybersecurity for Medical Domain

Course Module 2: Methodologies

1. Using AI and Cybersecurity Tools to Improve Medical Settings and Systems
2. Design and Implementation of Secure and Intelligent Medical Systems
3. Secure and Intelligent Data Collection and Analysis in Medical Domain: Process, Models, and Tools
4. Governance, Management, and Integrity of Medical Data
5. Intelligent Detection of Abnormal Medical Data and Intentional/Unintentional Medical Errors
6. Hardware and Software for Medical Information Processing, Classification, and Tracking

Course Module 3: Applications

1. Effective and Secure Usage of Digital Hospital
2. Safety, Privacy, and Security of Users in Digital Hospital
3. Real-World Applications of Using AI in Secure Medicine Discovery
4. Electronic Investigations of Crime Scenes from Medical Perspective
5. Advantaged and Disadvantages of Mobile and Cloud Computing for Medical Systems ([Medical Wearables](#))
6. Attacks and Defenses for Medical Systems
7. Sensor Interface Solutions for Secure, Intelligent, and Interoperable Medical Systems
8. Explainable Vision System for Testing and Assurance of Medical Chips
9. Physical Inspection and Assurance for Advanced Packaging and Heterogeneous Integration of Medical Chips
10. Applying AI and Security Methods in Networked Radiology Equipment
11. Adversarial Examples and Deepfakes for Fooling Medical Systems and Their Countermeasures

Course Module 4: Conclusions and Future Directions

1. Trustworthy and Conclusive Medical Assessments using AI
2. Challenges and Opportunities for Improving Secure and Intelligent Digital Hospital
3. Novel Technologies Specific to Medical Industry
4. Emerging Security and AI Trends in Medical Domain
5. New Research Topics on Secure and Intelligent Medical Systems ([for Thesis and Dissertation](#))