MODULE	TOPICS OF INSTRUCTION	READINGS/MULTIMEDIA	ASSIGNMENTS/QUIZZES/DB DUE IN THAT WEEK	OUTCOMES	COMPLETION TIME
Week 1	- Course overview - Introduction to Security Environment and Cryptography	**Watch**: - Video "Lec1" - Video "Lec2" **Reference material:** - Read Chapter 1 Network security (pg. 12 – 25) - Check PowerPoint "Lecture 1 and 2"	-Syllabus Quiz -Discussion Board (Introduce yourself to others) - Mock assignment submission	-Get to know peers and instructor - Familiarize with tools needed for course during the semester -Students can assess current security landscape	4 hours
Week 2	- Principles of Cyber-security - Vulnerabilities and Threats	**Watch:** - Video "Lec3" - Video "Lec4" **Reference material:** - Read Chapter 2 Network Security (pg. 26 – 40) - Check PowerPoint "Lecture 3 and 4"	- Quiz 1	-Familiarize with week 2 topics -Students can learn about existing vulnerabilities and threats, differences between them, how cryptography can achieve common security goals	5 hours
Week 3	- Stream Ciphers - Types of cryptosystems - Introduction to symmetric key crypto	**Watch:** - Video "Lec5" - Video "Lec6" **Reference material:** - Read Chapter 2 Cryptography (pg. 29 – 40) - Check Power Point "Lecture 5 and 6"	- Quiz 2	-Familiarize with week 3 topics -Assess the differences between symmetric and public key crypto, understand notions of symmetric key based encryption	6 hours
Week 4	- DES Encryption - Triple DES and Alternatives	**Watch:** - Video "Lec7" - Video "Lec8"	- Assignment 1 (Crypto code encryption and decryption based on classical ciphers)	-Familiarize with week 4 topics	7 hours

		Reference material: Chapter 3 Cryptography (pg. 55 – 77) -PowerPoint "Lecture 7 and 8"		-Students can learn and implement specifics of DES, a prominent block encryption based symmetric crypto standard	
Week 5	- AES Encryption - Block Ciphers: Modes of Operation	**Watch:** -Video "Lec9" -Video "Lec10" **Read:** Chapter 4 Cryptography (pg. 87 – 117) -PowerPoint "Lecture 9 and 10"	- Quiz 3	-Familiarize with week 5 topics - Students can learn and implement specifics of AES, symmetric crypto standard	7 hours
Week 6	- Block Ciphers: Modes of Operation Cont.d - Introduction to public key crypto	**Watch:** -Video "Lec11" -Video "Lec12" **Reference material:** - Read Chapter 5 Cryptography (pg. 123 – 133), Chapter 6 Cryptography (pg. 157 – 165) - Check Power Point "Lecture 11 and 12"	- Assignment 2 (Crypto-code cracking based mystery solving game) - Quiz 4	-Familiarize with week 6 topics - Students learn about different operation modes of block encryption and learn about AES and DES implementation specifics in these modes -Understand notions of symmetric key based encryption	6 hours
Week 7	- Modular Arithmetic - RSA Algorithm	**Watch:** -Video "Lec13" -Video "Lec14" **Reference material:** - Read Chapter 7 Cryptography (pg. 173 – 195)	No deadlines this week (Mid-term exam in this week)	-Familiarize with week 7 topics - Students will be introduced to computation in modular space and will learn RSA public key cryptosystem	4 hours

		- Check Power Point "Lecture 13 and 14"			
Week 8	- Project Overview and Guidelines - Discrete logarithm based crypto - Elliptic curve cryptography	**Watch:** -Video "Lec15_Project Guidelines" -Video "Lec16" **Reference material:** - Read Chapter 8 Cryptography (pg. 205 – 226) - Check Power Point "Lecture 15 and 16"	- Quiz 5	-Familiarize with week 8 topics - Understand project expectations and guidelines - Learn about elliptic curve cryptosystem and its additive homomorphism	5 hours
Week 9	- Elliptic curve cryptography Cont.d - Digital Signatures	**Watch:** -Video "Lec17" -Video "Lec18" **Reference material:** - Read Chapter 9 Cryptography (pg. 239 – 251), Chapter 10 (pg. 264 – 267, pg. 282 - 286) - Check Power Point "Lecture 17 and 18"	- Quiz 6 - Project Idea and Project Review 1 Report	-Familiarize with week 9 topics - Set a date for Blackboard Collaborate Session for first project review to update progress - Learn about elliptic curve cryptosystem and digital signatures feature of public key cryptosystems	6 hours
Week 10	- Hash Functions	**Watch:** -Video "Lec19" -Video "Lec20" **Reference material:** - Read Chapter 11 Cryptography (pg. 293 – 313)	- Assignment 3	-Familiarize with week 10 topics - Students can learn and implement specifics of SHA, HMAC. Understand about applications of hash functions for real time authentication	7 hours

		- Check Power Point "Lecture 19 and 20"			
Week 11	- Message Authentication Codes (MACs)	**Watch:** -Video "Lec21" -Video "Lec22" **Reference material:** - Read Chapter 12 Cryptography (pg. 319 – 328) - Check Power Point "Lecture 21 and 22"	- Quiz 7	-Familiarize with week 11 topics - Learn about security with message authentication codes	5 hours
Week 12	- Key Establishment	**Watch:** -Video "Lec23" -Video "Lec24" **Reference material:** - Read Chapter 13 Cryptography (pg. 331 – 347) - Check Power Point "Lecture 23 and 24"	- Quiz 8 - Project Review 2 Report	-Familiarize with week 12 topics - Set a date for second project review to update on project progress - Learn about certifying authorities in PKC, key establishment, key generation, and key exchange	6 hours
Week 13	- Privacy Preserving algorithms and architectures	**Watch:** -Video "Lec25" -Video "Lec26" **Reference material:** - Check PrivacyDoc.pdf (pg. 1 - 30) - Check Power Point "Lecture 25 and 26"	- Assignment 4	-Familiarize with week 13 topics - Understand the role of privacy and its importance in this internet-connected world. Study algorithms and tools to protect privacy.	7 hours

Week 14	- Privacy Preserving algorithms and architectures Cont.d	**Watch:** -Video “Lec27” -No lecture: Thanksgiving Holiday **Reference material:** - Check PrivacyDoc.pdf (pg. 31 – 65) - Check Power Point “Lecture 27”	- Quiz 9	-Familiarize with week 14 topics - Study algorithms and tools to protect privacy. Learn about privacy in design and implementation.	4 hours
Week 15	- Policies and Emerging Topics - Metrics	**Watch:** -Video “Lec28” -Video “Lec29” **Reference material:** - Check PrivacyDoc.pdf (pg. 66 – 97) - Check Power Point “Lecture 28 and 29”	- Quiz 10 - Project Review 3 Report **Upcoming deadline** - Project Submission (due on the day of final exam)	-Familiarize with week 15 topics - Set a date for Blackboard Collaborate Session for final project review -Students can learn about emerging security and privacy techniques, and can assess the role of good metrics and key performance indicators (KPIs) in security-based architectures	6 hours