FIRST YEAR (FRESHMAN)											
Course Code		Title	LC	LB	CR	Course Code		Title	LC	LB	CR
MATH	101	Calculus I	4	0	4	MATH	102	Calculus II	4	0	4
PHYS	101	General Physics I	3	3	4	CYB	201	Fundamentals of Information Security	3	0	3
ENGL	101	An introduction to Academic Discourse	3	0	3	ENGL	102	Introduction to Report Writing	3	0	3
IAS	111	Belief and its Consequences	2	0	2	CSE	102	Introduction to Computing I	2	3	3
PE	101	Health and Physical Education I	0	2	1	IAS	101	Practical Grammar	2	0	2
XX	xxx	Science Elective *	-	-	3	PE	102	Health and Physical Education II	0	2	1
			12	5	17				14	5	16
SECOND YEAR (SOPHOMORE)											
Course Code		Title	LC	LB	CR	Course Code		Title	LC	LB	CR
EE	200	Digital Logic Circuit Design	3	3	4	CSE	253	Discrete Structures	3	0	3
CSE	201	Introduction to Computing II	3	3	4	DSC	290	Computational Linear Algebra**	3	0	3
CYB	233	Economics of Cybersecurity	3	0	3	CSE	202	Data Structures	3	3	4
MATH	201	Calculus III	3	0	3	SWE	205	Introduction to SWE	3	0	3
IAS	212	Professional Ethics	2	0	2	SWE	215	Software Requirement Engr.	2	3	3
ENGL	214	Acad. & Prof. Communication	3	0	3						
			17	6	19				14	6	16
THIRD YEAR (JUNIOR)											
Course Code		Title	LC	LB	CR	Course Code		Title	LC	LB	CR
CSE	333	Computer Arch. & Ass. Lang.	3	3	4	STAT	319	Prob. & Stat. for Engineers	2	3	3
CYB	301	Data Security & Privacy	3	0	3	CYB	305	Computer Forensics	2	3	3
CSE	324	Database Systems	3	3	4	CSE	343	Fund. of Computer Networks	3	3	4
IAS	201	Writing for Professional Needs	2	0	2	CYB	311	Introduction to Server Administration	2	3	3
XX	XXX	Free Elective	3	0	3	SWE	387	SW Project Mgt	3	0	3
						IAS	301	Oral Communication Skills	2	0	2
			14	6	16				14	12	18
Summer Session						CYB	399	Summer Training	0	0	0
FOURTH YEAR (SENIOR)											
Course Code		Title	LC	LB	CR	Course Code		Title	LC	LB	CR
CYB	315	Ethical Hacking	2	3	3	CSE	451	Computer and Network Security	3	0	3
CYB	322	Introduction to Information Assurance	3	0	3	CYB	419	Project	1	6	3
CYB	341	Web Application Security	3	0	3	CSE	401	Operating Systems	3	3	4
GS	xxx	GS Elective	3	0	3	XX	XXX	Major Elective I	3	0	3
IAS	322	Human Rights in Islam	2	0	2	XX	XXX	Major Elective II	3	0	3
			13	3	14				13	9	16
TOTAL CREDITS: 132											

Science Elective * minimum of 3 credit hours (either BIOL 233 or CHEM 101 etc.)
Computational Linear Algebra** Student may take Math 280 (Linear Algebra)

COURSE DESCRIPTION

CYB 201 Fundamentals of Information Security **(3-0-3)**

This course aims to introduce students to the basic concepts and topics related to Information Systems and Security. It lays the foundation for understanding terminology, principles, processes and best practices of information security at local and global levels. It further provides an overview of basic security vulnerabilities and countermeasures for protecting information assets through planning and administrative controls within an organization.
Prerequisite: None

CYB 233 Economics of Cybersecurity **(3-0-3)**
Focuses on the underlying economic factors of cybersecurity and highlights the incidents of security failures that happen due to misaligned incentives rather than to the lack of suitable technical protection mechanisms. Topics include economic perspective of cybersecurity, cultural perspective of cybersecurity, blockchain technology, economics of privacy, economics of malware, economics of authentication, the information security business, economics of vulnerabilities, copyrights and rights management, cybercrime cost measurement, theoretical models, forensic economics.
Co-requisite: CYB 201

CYB 301 Data Security & Privacy **(3-0-3)**
This course presents relevant aspects of data security and privacy. It includes the following topics: Security fundamentals: concepts and principles, vulnerability, threat models, attacks to computer systems. Legal and social aspects of privacy, anonymization techniques, statistical database privacy, cryptographic techniques, privacy preserving database, privacy issues in various domains (e.g., health care, and social networks).

Prerequisites: Junior Standing

CYB 305 Computer Forensics **(2-3-3)**
Digital forensics including computers, mobile devices, and network traffic. The course covers different types of software tools and techniques in order to perform forensic investigations. Topics include introduction to digital forensics, data acquisition, computer forensics analysis, mobile forensics analysis, network log and traffic acquisition, and network forensics analysis.
Prerequisite: CYB 201

CYB 311 Introduction to Server Administration **(2-3-3)**

Understanding server installation. Server roles. Active directory. Storage technologies. Performance management. System security and Server maintenance.

Prerequisites: Junior Standing

CYB 315 Ethical Hacking **(2-3-3)**

Introduction to hacking techniques and exploits for ethical purpose. Topics include pentesting scope and rules of engagement, reconnaissance, host discovery, port scanning, vulnerability scans, exploit launch and development, privilege escalation, password cracking, and postexploit strategies.
Prerequisites: CYB 311

CYB 322 Introduction to Information Assurance **(3-0-3)**

Formal models and principles of computer security to achieve information assurance. Topics include security policies in an enterprise, multi-level security models, access control models and implementation, security evaluation, security risk assessment, legal and ethical aspects of security. **Prerequisite:** CSE 253

CYB 341 Web Application Security **(3-0-3)**

Identification and prevention of security vulnerabilities in web applications. Topics include Cross-site scripting (XSS), Cross-Site Request Forgery, Browser Security, Secure Web Development. **Prerequisite:** CSE 201

CYB 399 Summer Training **(0-0-0)**

A summer period of 8 weeks spent as a trainee in industry, business, or government agencies for the purpose of familiarizing the student with the real job world and enabling him to apply and relate his academic knowledge to a real work environment. The student is required to participate in computer science related activities and use his time to get acquainted with the computer science related functions and resources used by his employing organization. Besides progress reports, the student is required to submit a final report and do a presentation on his experience and the knowledge he gained during his summer training program. The student receives a zero-credit Pass/Fail grade.
Prerequisites: SWE 363, ENGL 214, and Department Approval

CYB 419 Project **(1-6-3)**

The student will work on an applied project designed to develop his interest in some application of computer/cyber security to a real life problem. Student is expected to submit a written report at the end of the project. At the end of the semester, students are asked to make an oral presentation with the presence of faculty members as referees.

Prerequisites: CYB 341 and SWE 387

CYB 490 Special Topics I **(3-0-3)**

State-of-the-art topics in Cyber Security.

Prerequisite: Department approval.

CYB 491 Special Topics II **(3-0-3)**

State-of-the-art topics in Cyber Security.

Prerequisite: Department approval

CYB 457 Introduction to Cloud Computing **(3-0-3)**

An introduction and broad view of cloud computing and its applications. Topics include Datacenter architectures, the MapReduce programming model, Hadoop, cloud algorithms, commercial cloud computing platforms such as Amazon EC2 and Google App Engine, and higher-level programming such as Hive and Pig.

Prerequisite(s): CSE 202.

CYB 447 Computer Crime Investigation **(3-0-3)**

Covers the world of computer forensics and computer crime. This includes the seizing and handling of digital evidence, investigating Internet facilitated offenses, victimology, criminal profiling and legal considerations. Students will complete a variety of hands-on projects throughout the course.

Prerequisite(s): CYB 305.

CYB 497 Wireless and Mobile Security **(3-0-3)**

This course provides knowledge about Wireless and Mobile security. Students will have the necessary knowledge of how secure communication is possible through wireless media. Also, they will study the emerging topics on security and privacy in mobile and wireless computing, including misbehavior detection in wireless networks, wireless routing privacy, malicious access point detection, cognitive authentication, privacy protection etc.
Prerequisite(s): CSE 451

CYB 449 Intrusion forensics and network analysis **(3-0-3)**

As a result of advances in technology and a consequent rise in computer-related crime and victimization, there is a need for experts in detecting when an unlawful intrusion has occurred and who is responsible. This course emphasize ethical considerations as well as proper procedures for advanced intrusion analysis and the forensic investigation that follows.
Prerequisite(s): CYB 305

CYB 453 Advanced topics in computer forensics **(3-0-3)**

Advanced topics and concepts in cybersecurity and computer forensics: cyber defense tools, attack methods, and technologies.
Prerequisite(s): CYB 305

CYB 455 Access Method and data hiding **(3-0-3)**

Data hiding, including methods of anonymity, steganography, cryptography, and anti-forensics.
Prerequisite(s): CSE 451, CYB 305

CYB 456 Autonomous cyber operations **(3-0-3)**

Construction, discovery and analysis of viral code from both a defensive and offensive standpoint. Legal issues associated with autonomous cyber operations will also be addressed.

Prerequisite(s): CSE 309, CSE 451, CYB 305

CYB 459 Advanced topics in cyber operations **(3-0-3)**

Scenario-based applying cyber operations techniques to realistic, systems-oriented problem sets in an integrated defensive/offensive virtual environment. This course will also address cyber incident response.

Prerequisite(s): CSE 309, CSE 451, CYB 305