وصف المساقات

أسم المادة	Computer Skills (2) (for science students) (C++)			Course number	401112
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3	✓	409100	
This course introduces programming concepts and prepares students to understand the more complicated and powerful programming tools and concepts in the following courses. It contains an introduction to programming language history, basic hardware and software concepts, basic problem-solving techniques, and the different types of programming languages. It uses C++ programming language to give students a good understanding of a typical program development environment, control statements, functions, arrays, pointers and pointer-based					

أسم المادة	Calculus (1)			Course number	404101
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3			
This course is designed to introduce the student to a number of numerical methods as well as to teach the student how to do some error analysis. These include methods to approximate roots of functions, to interpolate data points with polynomials and to solve linear system strings.					

أسم المادة	Statistics and Probability (1)			Course number	404131
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3			
Introduction to Statistics, populations and samples, Frequency distributions, Measures of central tendency, Measures of dispersion, Measures of skewness and kurtosis, correlation and regression, principles of probability, Rules of probability, Bayes, Theorem. The Random, variables, discrete and continuous distributions expectation.					

أسم المادة	Programming Language (1)			Course number	407212
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3	✓	401112	
This course gains knowledge about basic C++ language syntax and semantics to write C++ programs and use concepts such as variables, conditional and iterative execution methods etc. Beside; understanding the fundamentals of object-oriented programming in C++, including defining classes, objects, invoking methods, in addition to the main principles in OOP that talks about "Encapsulation", "Inheritance", "Polymorphism" and "Interface".					

أسم المادة	Introduction to Information Technology			Course number	409100
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3		401099	
This course presents an introductory survey of computer science. It explores the breadth of the subject while including enough depth of the topics involved. The goal of this course is to introduce the student to key terminology and components of computer hardware, software, and operating systems. Discuss the functions and uses of computers in our society, Describe the information					

processing cycle, and identify the major components of computer hardware and there functions. This course is an introduction to problem solving by using Pseudo code, and flowcharting.

أسم المادة	Simulation and Modeling			Course number	401253
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3		404131	

This course is designed to provide the concepts of computer simulation. Simulation methodology: Analysis, formulation, solution strategy, verification and validation. Discrete simulation. Collection and analysis of results. Simulation languages applications.

أسم المادة	Programming Languages Design and Implementation			Course number	401452
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3		407212	

This course is designed to provide the students of the basic concepts related to PLD. Theoretical concepts such as virtual computer, firmware, syntax, semantic, Grammar description method are fully described. The main issues related to design and implementation of programming language such as data type, sequence control, data control, run time environment are covered in details.

أسم المادة	Linear Algebra 1			Course number	404241
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3		404101	

The course is an introduction to linear algebra. This includes matrices, systems of linear equations and their solutions, linear vector spaces, linear transformations, eigenvalues and eigenvectors.

أسم المادة	Graph theory			Course number	404463
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3		404241	

This course will cover the fundamental concepts of Graph Theory: simple graphs, digraphs, Eulerian and Hamiltonian graphs, trees, matching, networks, paths and cycles, graph colorings, and planar graphs.

أسم المادة	Introduction to Algorithms			Course number	401115
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3		401112	

Solving summations and recurrences. Efficiency and complexity analysis. Tree terminology and algorithms. Binary trees. Hashing methods and solving collision in hashing. Heaps and heap sort. Insertion sort, merge sort and quicksort. Graph terminology, representation and algorithms. Algorithms of Prim, Kruskal, Dijkstra and Floyd. Breadth-first and depth-first search. The greedy, divide-and-conquer, and dynamic programming techniques.

أسم المادة	Programming Language (2)			Course number	401212
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3	✓	401112	
This course gains knowledge about basic C++ language syntax and semantics to write C++ programs					

أسم المادة	Computer Networks 1			Course number	409100
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3	✓	401112	
After completing this course, the student will have sufficient information about networks in terms of studying the forms of networks, how networks can be designed, signals and their types, cables type, OSI model, TCP/IP communication.					

أسم المادة	Cyber Security Principles			Course number	407101
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3			
The goal of this course is to introduce the threats and risks in Information technology and networks, and how to control and secure these systems in IT fields, The topics will be covered are: software and operating system security, data and database security, network security, IP, firewalls, security management and computer crimes and ethical and legal issues in computer security.					

أسم المادة	Electronic Commerce Security			Course number	407314
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3		407101	
This course introduces current threats facing organizations that conduct business online and how to mitigate these challenges. It will cover cryptography review, certificates, secure credential services and role-based authorization, mobile code security, security of agent-based systems, secure electronic transactions, electronic payment systems, intellectual property protection, and issues on law and regulation.					

أسم المادة	Artificial Intelligence			Course number	407120
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3		401115	
This course introduces the basic principles in artificial intelligence. It covers simple representation schemes, problem solving paradigms, constraint propagation, and search strategies. Areas of application such as knowledge representation, natural language processing, expert systems, vision and robotics are explored.					

أسم المادة	Risk Management and Assessment			Course number	407201
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3		407101	
Students understand the principles and terminology related to risk management, including contingency elements and risk factors, risk mapping and standard mitigation factors (e.g. Insurance, hedging, limits, diversification, control...), Students can					

calculate and give appropriate interpretation of Value-at-Risk on individual instruments as well as on a whole portfolio, Students understand risk management's best practice in all its key areas, including financial risk management and business risk management.	

أسم المادة	Information Security Programming Using Python			Course number	407203
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3	✓	407212	
This course gains knowledge about basic concepts of Programming and problem solving using Python, including how to create and run scripts, use threads, and handle exceptions. After that, a student will learn how to use the Python libraries for network scripting and develop basic scripts with network functionality. This course will also cover HTTP programming, security scripting, and forensic scripting. Finally, the student will learn about Twisted Python, including the Echo server and HTTP client, debugging and security testing using Python.					

أسم المادة	Data Encryption			Course number	407204
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3		409100	
This course introduces the concepts and methodology of data encryption and decryption, a brief history of encryption and decryption, the importance of data, the algorithms used of encryption and decryption such as RSA, DES, etc., and protocols for data security.					

أسم المادة	Data and Software Security			Course number	407210
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3		407203	
The goal of this course is to introduce the security issues of software and applications on the levels of design and programming. What are the main vulnerabilities in software and programming, and what are the attacks that attacks the software systems, such as XSS , SQL Injection, DoS, CAPTCHA.,					

أسم المادة	Data Structures			Course number	407251
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3	✓	401112	
Principles of data design. Data types and structures. Abstract data types (ADTs) and encapsulation. Unsorted List and Sorted List ADTs. Stack and Queue ADTs. Linked structures. Implementing Unsorted Lists, Sorted Lists, Stacks and Queues as linked structures. Programming with recursion. Binary Search Trees.					

أسم المادة	Data Analytics			Course number	407302
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3		409255	
This course presents an introductory survey of data science. The goal of this course is to introduce the student to key terminology					

and components of data science, data analysis, and the value of data. Through this course the students will know the tools and applications used with data analytics.

أسم المادة	Introduction to Digital Forensic Evidence			Course number	407310
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3		407204	
The students will learn and practice the methods and techniques used in computer forensics, forensic modeling, the forensics analysis and the e-evidences, following up the new methods for digital investigation and evidences. The computer crimes, its details and its occurrence. Privacy protection techniques, computer security policies and guidelines.					

أسم المادة	Network Security and applications			Course number	407312
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3		401224	
This course aims to the methods of computer network protection. And what are the types of attacks may occur on computer networks, and how to protect network against these attacks. What is firewall, and VPNs, and threats, snipping, and other concepts.					

أسم المادة	Network Control and Documentation			Course number	407316
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3	✓	401224	
The goal of this course is to introduce the management of network, users, guests and different roles access to the network and systems and what are their tasks, privileges and permissions, it also illustrate the authorization, authentication and log files management. Network and OS management and some protocols related to network control and documentation. The topic to be covered also is management of VPNs.					

أسم المادة	Secure Communication Protocols			Course number	407322
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3		407312	
The goal of this course is to introduce the threats and risks in Information technology and networks, and how to control and secure these systems in IT fields. The course examines the use of security protocols to provide security over networks and Internet. The topics will be covered are: network access control, cloud security, transport-level security, network security, internet Security, e-mail security, IP security, firewalls.					

أسم المادة	Ethical Hacking			Course number	407325
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3	✓	407322	
Students will scan, test, hack and secure systems. Implement perimeter defenses, scan and attack virtual networks. Other topics include intrusion detection, social engineering, foot printing, DDoS attacks, buffer overflows, SQL injection, privilege escalation,					

trojans, backdoors and wireless hacking. Legal restrictions and ethical guidelines emphasized. This course also helps prepare students to pass the Certified Ethical Hacker (C|EH) exam.

أسم المادة	Web Applications Programming			Course number	406356
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3		401112	

The course is designed to present the student with the required information and practice related to Web programming. This includes introduction to ASP.NET; Working with Controls; Using Rich Server Controls; Accessing Data; Configuration; Data Binding; Validating User Input; Themes and Master Pages; Site Navigation Controls; Displaying Data with the GridView Control; Tracing; Creating New Controls; Improving Performance with Output Caching; Advanced Caching; Using the DataList and Repeater Controls; and Creating and Consuming Web Services.

أسم المادة	Infrastructure Security Using Linux			Course number	407401
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3	✓	407312	

An introduction to Linux operating system concepts, including installation and maintenance are provided. Emphasis is placed on the concepts of operating system, management, maintenance, and required resources. At the end of this course, students will understand the concepts of operating system, installation, management, maintenance, and use of Linux operating systems. Basic Linux commands and programs, standard software development tools, such as Emacs, Compilers, Debuggers, Make Facility, and common system tasks common to using Shell scripts and platform management.

أسم المادة	Practical Training - For Cyber Security Students			Course number	407421
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3		+ 90 Cr. Hr.	

Student should register as trainee in digital Forensics Investigations. The registration must have the department approval. The purpose of the supervised field training experiences is for student to synthesize the knowledge and skills developed during his academic portion of the program in a practical setting. The expectation is that the field training will provide learning opportunities unavailable in a classroom setting. The student's field training faculty advisor monitors student progress and provides them with on-site supervision and support. The 6 credit hours are equivalent to 280 training hour.

أسم المادة	Graduation Project - For Cyber Security Students			Course number	407422
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3		+ 90 Cr. Hr.	

Students to communicate, present, and exhibit significant knowledge and understanding of a project idea that demonstrates knowledge, application, analysis, synthesis, and evaluation of information gained throughout their study. At the end of this semester, students expected to submit a proposal of their project.

أسم المادة	Database			Course number	409255
	Credit hours	theoretical	practical	PREREQUISITE	

	3	3		401112	
This course provides a comprehensive concepts of the relational database design and SQL (implemented in Oracle) used with relational databases. The presentation stresses at relational data model; relational algebra; SQL; database analysis and design; ER and enhanced modeling; data normalization.					

Major Elective Requirements (9 Credit hours)

أسم المادة	Internet of Things Security			Course number	407202
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3		407101	
This course aims to introduce the concept of the Internet of Things, understand the structure and components of the Internet of Things. An introduction to IOT security, IOT ethics and privacy is presented. Describe building automation and security. The use of IOT in different areas: energy and environment, healthcare infrastructure and consumer electronics. From this course, students will become familiar with the cyber security issues raised by the Internet of Things and gain knowledge of related security technologies.					

أسم المادة	Cyber Security Systems			Course number	407214
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3	✓	407101	
The goal of this course is to introduce the systems that need to be protected and secured, and what are the main topics and issues for different systems, platforms and infrastructure. Students will explore various techniques for eliminating security vulnerabilities, defining security specifications / plans, and incorporating countermeasures in order to achieve overall system assurance.					

أسم المادة	Data Security and Privacy			Course number	407324
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3		407101	
This course aims to introducing the main concepts of data, and its significance, the security and privacy issues for data, and sensitivity of data. It also includes the introduction to threats in Database and E-commerce and what are the policies and methods to treat these threats, and what are the hot topics in data security and privacy.					

أسم المادة	Selected Topics in Cyber Security (1)			Course number	407327
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3		+ 90 Cr. Hr.	
This course covers selected topics in current research and advancements in various Cyber Security fields.					

أسم المادة	Security of Distributed Computing			Course number	407338
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3		407312	
This course aims to define the basic concepts and principles in the field of distributed computing. Cryptographic techniques form					

the basis for securing distributed systems. This course focuses on security in networks and distributed systems and gives a short introduction to encryption. Threats against distributed systems are covered, in addition to the methods, techniques, and standards in place to protect against these threats.

أسم المادة	Cyber Security Management Systems			Course number	407410
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3		407201	

The purpose of this course is to provide students with an overview of Cyber security, and specifically, Cyber security applied to Business and commercial Systems in IT fields. The main methodologies, standards, legislation, threats, and vulnerabilities will be studied. Further emphasis will be placed on technologies that help to prevent, detect, and respond to cyber security incidents.

أسم المادة	Penetration Testing			Course number	407412
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3	✓	407325	

The goal of this course is to teach students the underlying principles and many techniques associated with the cyber security practice known as penetration testing and protection. It introduces students to penetration testing and vulnerability analysis. It will cover in-depth methodologies, techniques, and tools to identify vulnerabilities, exploit, and assess security risk to networks, operating systems, and applications. Student discovers how system vulnerabilities can be exploited and learns to avoid such problems.

أسم المادة	Wireless network security			Course number	407425
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3		407312	

This course covers security and privacy issues in wireless networks and systems, such as cellular networks, wireless LANs, wireless PANs, mobile ad hoc networks, vehicular networks, satellite networks, wireless mesh networks, sensor networks and RFID systems. Security problems of MAC and especially upper layers will be emphasized. Attacks and proposed solutions at several layers, authentication, key distribution and key management, secure routing, selfish and malicious behaviors, and secure group communication are analyzed for applicable wireless network types.

أسم المادة	Cyber Security Management and Hierarchy			Course number	407426
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3		407410	

The goal of this course is to introduce the management system of cyber security. The infrastructure and platforms are for different types of systems.

أسم المادة	Selected Topics in Cyber Security (2)			Course number	407427
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3		+ 102 Cr. Hr.	

This course covers selected topics in current research and advancements in various Cyber Security (Advanced Encryption) fields.

أسم المادة	Discrete Mathematics			Course number	407152
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3		409100	
This course will cover the following topics and specific applications in computer science. Numbers and Exponents, Errors (absolute and relative), Propositions Logic, Predicates and Quantifiers, Quantifiers and logical operators, Logical Inference, Methods of Proof, Sets , Relations and Functions					

.

أسم المادة	Network and Data Communication			Course number	407326
	Credit hours	theoretical	practical	PREREQUISITE	
	3	3		401224	
This is a first class on the fundamentals of data communication networks, their architecture and network layers, principles of operations, protocols of transmission and performance analyses. One goal will be to give some insight into the rationale of why networks are structured the way they are today and to understand the issues facing the designers of next-generation data networks. Much of the class will focus on network algorithms and their performance.					